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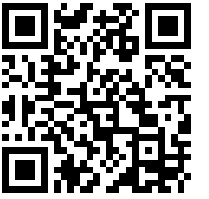
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SAGINAW, MICHIGAN

Manufacturers' Agents, Jobbers and Distributers

HONORARY MEMBERS OF THE

MICHIGAN STATE MILLERS ASSOCIATION
MICHIGAN BEAN JOBBERS ASSOCIATION

This catalogue is not complete. To illustrate and describe all the articles we carry in stock or are agents for would require a book several times the size of this one. Our policy is a progressive one, and we are constantly adding to the goods we handle, so that if what you want is not shown herein, possibly we have it in stock.

We represent the most reliable manufacturers in the country on the lines we carry. We guarantee our goods to be as good as we say they are, and are ready to make good quickly and willingly any guarantee we make.

Terms: 30 days net, unless otherwise agreed upon.

All list prices and quotations subject to change without notice.

Our responsibility ceases when goods are delivered to transportation companies in good order, and we receive a clear receipt therefor.

All claims for shortages must be made within five days after receipt of goods.

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All returned goods will be subject to discount less freight, express and drayage.

No claim for labor or for damages to goods in transit will be allowed.

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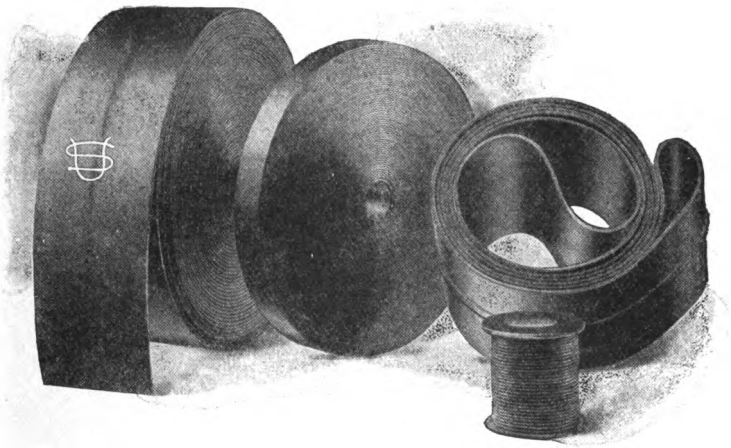
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For Useful Information see pages 236 to 251.

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LEATHER BELTING



We sell but the highest grade of Leather Belting which is made from the center of long process oak tanned belting butts.

Guaranteed to give satisfactory service.

ADOPTED NOVEMBER 21, 1906

Per Running Foot		Per Running Foot		Per Running Foot	
½ inch	$0 12	6½ inch	$1 56	27 inch	$ 6 48
⅝ "	15	7 "	1 68	28 "	6 72
¾ "	18	8 "	1 92	29 "	6 96
⅞ "	21	9 "	2 16	30 "	7 20
1 "	24	10 "	2 40	32 "	7 68
1¼ "	30	11 "	2 64	34 "	8 16
1½ "	36	12 "	2 88	36 "	8 64
1¾ "	42	13 "	3 12	38 "	9 12
2 "	48	14 "	3 36	40 "	9 60
2¼ "	54	15 "	3 60	42 "	10 08
2½ "	60	16 "	3 84	44 "	10 56
2¾ "	66	17 "	4 08	46 "	11 04
3 "	72	18 "	4 32	48 "	11 52
3¼ "	78	19 "	4 56	50 "	12 00
3½ "	84	20 "	4 80	52 "	12 48
3¾ "	90	21 "	5 04	54 "	12 96
4 "	96	22 "	5 28	56 "	13 44
4½ "	1 08	23 "	5 52	60 "	14 40
5 "	1 20	24 "	5 76	64 "	15 36
5½ "	1 32	25 "	6 00	68 "	16 32
6 "	1 44	26 "	6 24	72 "	17 28

The prices shown are for running feet of single belting in the widths stated; double belting is twice the price of single. Unlisted sizes take the price of the nearest higher listed size.

In orders for quarter turn belts, express mention should be made of such use, and in general it is advantageous to state for what purpose the belt is to be used.

SOLID AND TWIST LEATHER BELTING

Size.....inches	⅛	3/16	¼	5/16	⅜	½	⅝	¾	⅞	1
Solid.....per foot	$0 05	07	10	14	18					
Twist..... "	06	10	14	18	22	30	36	46	60	72

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RUBBER BELTING

OUR BRANDS:
"GIANT" AND "SHAWMUT"

"GIANT" STITCHED BELTING

"Giant" is the *original* stitched Rubber belt, and the best.

It is the most economical RUBBER Belt to use.

The plies are strongly frictioned, and stitched with heavy thread, in rows one inch apart, lengthwise of the belt.

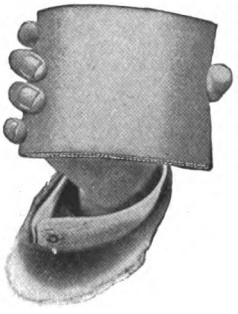
The cover is seamless and smooth: either side can be run next to the pulleys.

It will run perfectly true on the pulleys.

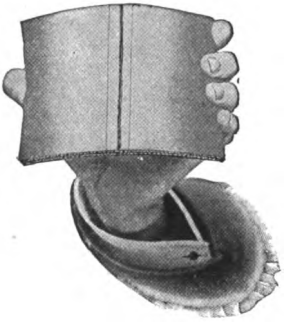
It will transmit more power than any other RUBBER belt.



Where other RUBBER belts have failed, "Giant" has given perfect satisfaction.



Our Style



Old Style

"SHAWMUT" SEAMLESS BELTING

A medium price Rubber belt designed for general work.

Entirely seamless.

Prices on opposite page.

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RUBBER BELTING

PRICE LIST

Width in Inches	Per Foot						
	2-ply	3-ply	4-ply	5-ply	6-ply	7-ply	8-ply
1	$0.07	$0.09	$0.11				
1¼	.09	.11	.14				
1½	.11	.13	.16				
2	.15	.17	.21	$0.26	$0.32		
2½	.18	.22	.26	.32	.39		
3	.22	.26	.31	.38	.46		
3½	.26	.30	.37	.46	.56		
4	.30	.34	.42	.52	.63		
4½	.33	.39	.47	.58	.71		
5	.36	.43	.52	.65	.78		
6	.43	.52	.62	.77	.93	$1.09	$1.24
7	.51	.60	.73	.91	1.09	1.27	1.46
8	.59	.70	.84	1.05	1.26	1.47	1.68
9	.67	.80	.95	1.18	1.42	1.66	1.90
10	.75	.90	1.07	1.33	1.60	1.87	2.14
11	.83	1.00	1.18	1.47	1.77	2.06	2.36
12	.91	1.08	1.30	1.62	1.95	2.27	2.60
13	1.00	1.18	1.42	1.77	2.13	2.48	2.84
14	1.08	1.28	1.54	1.92	2.31	2.69	3.08
15	1.16	1.38	1.66	2.07	2.49	2.90	3.32
16	1.25	1.50	1.78	2.22	2.67	3.11	3.56
18	1.41	1.70	2.02	2.52	3.03	3.53	4.04
20	1.58	1.90	2.26	2.82	3.39	3.95	7.52
22	1.76	2.12	2.52	3.15	3.78	4.41	5.04
24	1.96	2.36	2.80	3.50	4.20	4.90	5.60
26	2.15	2.60	3.08	3.85	4.62	5.39	6.16
28	2.35	2.84	3.36	4.20	5.04	5.88	6.72
30	2.55	3.10	3.64	4.55	5.46	6.37	7.28
32	2.75	3.35	3.92	4 90	5.88	6 86	7.84
34	2.95	3.60	4.20	5.25	6.30	7.35	8.40
36	3 15	3.85	4.48	5.60	6.72	7.84	8.96
38	3.35	4.10	4.76	5.95	7.14	8.33	9.52
40	3.55	4.35	5.04	6.30	7.56	8 82	10.08
42	3.75	4.60	5.32	6 65	7.98	9.31	10.64
44	3.95	4.85	5.60	7.00	8.40	9.80	11.20
46	4.15	5.10	5.88	7.35	8.82	10.29	11.76
48	4.35	5.35	6.16	7.70	9.24	10.78	12.32
50			6.44	8.05	9.66	11.27	12.88
52			6.72	8.40	10.08	11.76	13.44
54			7.00	8.75	10.50	12.25	14.00
56			7.28	9.10	10.92	12.74	14.56
58			7.56	9.45	11.34	13.23	15.12
60			7.84	9.80	11.76	13.72	15.68

All other widths and plies at proportionate prices.

ENDLESS BELTS

Made to order. Three feet charged extra for splice.

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CANVAS BELTING



Alpha Canvas Stitched Belting is strong—standing a strain of 1400 lbs. to each inch width of 4-ply. Ordinary red stitched canvas belting will break under a much less strain.

There are only two ways to make Alpha belting run crooked on the pulleys—to lace the belt crooked or have the pulleys out of line. Cut your belt square, lace the belt straight, and if your machinery is properly lined up, we will guarantee Alpha belting will run absolutely true from the very start.

Alpha Canvas Belting is guaranteed to be stronger, stretch less, run absolutely true, last longer and transmit more power than any other make of canvas belt.

Inch	4-Ply	6-Ply	8-Ply	10-Ply
1½	$0 15	$....	$....	$....
2	20			
2½	25			
3	30	0 44		
3½	35	51		
4	40	58	0 76	
4½	45	65		
5	50	73	95	
6	60	87	1 14	
7	70	1 02	1 33	
8	80	1 16	1 52	
9	90	1 31	1 71	
10	1 00	1 45	1 90	
12	1 20	1 74	2 28	2 82
13	1 37	1 99	2 60	
14	1 47	2 13	2 79	3 45
16	1 68	2 44	3 19	3 95
18	1 89	2 74	3 59	4 44
20		3 05	3 99	4 94
22		3 35	4 39	5 43
24		3 65	4 79	5 92
26		4 15	5 43	6 72
28		4 47	5 85	7 24
30		4 79	6 27	7 76
32			6 69	8 27
36			7 52	9 31

Endless belts made to order.

Three feet extra charged for splice.

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WHITE COTTON BELTING



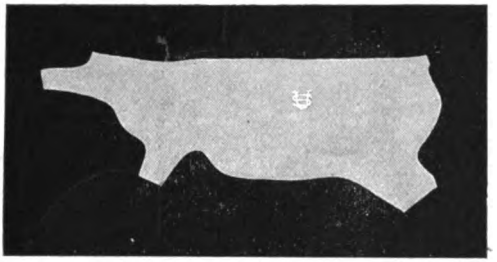
"KK" or King Kotton is a plain solid woven white cotton belting, made of the very best grade of selected cotton. Especially designed for elevating and conveying purposes and the transmission of power in most cases. We do not advise its use over small rapid moving pulleys or in damp places, as moisture causes it to stretch and shrink.

Width	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply
1 inch	$0 04	$..	$..	$..	$..
1½ "	05	06	..	..	..
2 "	06	08	12	20	22
2½ "	06½	10	14	22	24
3 "	07	12	16	26	28
3½ "	08	14	18	30	32
4 "	09	15	21	34	36
4½ "	..	17	24	36	39
5 "	13	19	26	38	41
5½ "	..	21	28	40	44
6 "	17	23	30	42	46
7 "	19	27	34	45	51
8 "	21	31	38	50	57
9 "	23	35	44	56	66
10 "	26	39	50	63	75
12 "	33	48	60	75	90
14 "	41	60	75	94	1 12
15 "	..	..	83	1 03	1 23
16 "	49	72	90	1 12	1 35
18 "	57	82	1 00	1 28	1 50
20 "	61	90	1 15	1 44	1 72
22 "	65	1 00	1 35	1 62	1 94
24 "	69	1 10		1 80	2 16

Any intermediate width made to order. We can also furnish 8-ply to order, and 2 and 3-ply as wide as 50 inches. Wide widths quoted on application.

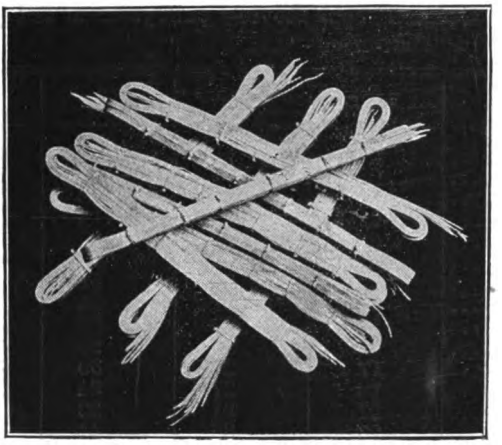
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RAWHIDE LACE LEATHER



U. S. Brand Rawhide Lace Leather is the product of the largest and oldest established lace leather factory in the country. It is the strongest and most durable lace leather made and will give perfect satisfaction.
Price, per square foot $0 40

RAWHIDE AND TANNED CUT LACE



Cut Raw Hide Belt Lacing is made from U. S. sides and possesses all the strength and durable qualities that have made this a standard brand.

PRICE PER 100 FEET

¼-inch..... $1.25	7/16-inch..... $2.00	¾-inch..... $3.75
5/16 " 1.50	½ " 2.25	1 " 5.00
⅜ " 1 75	5/8 " 3.00	

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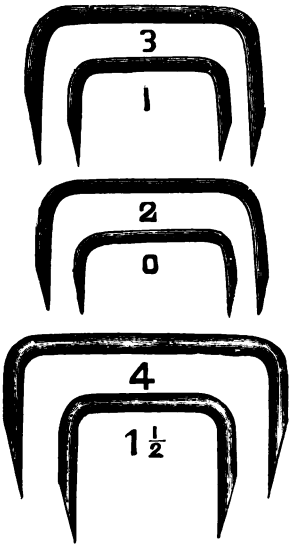
McOVEL TRADE MARK

IMPROVED BELT FASTENERS

Are recognized as being the best and cheapest device for fastening belts together, and the constantly increasing demand justifies that fact. They are made of special tempered steel wire, so that the points won't break in the clinching. They are made in six sizes and are put up 200 in a box.

PRICE PER 1,000, ALL SIZES
$1.50 NET

Cut Full Size of Fasteners



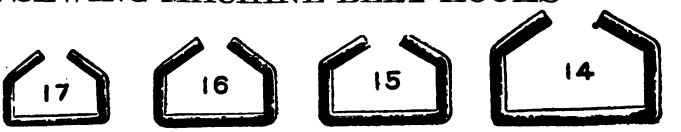
THE LX IMPROVED OVAL POINTED BELT HOOK



No.	Length	Number in Box	Price Per 1000
15	23/32 inch	250	$ 2 00
14	23/32 inch	250	2 40
13	3/4 inch	500	2 60
12	25/32 inch	250	2 80
11	29/32 inch	500	3 00
10	1 1/32 inches	250	3 50
9	1 1/8 inches	250	4 00
8	1 1/4 inches	250	5 00
7	1 13/32 inches	250	6 00
6	1 3/4 inches	250	8 50
5	2 1/32 inches	250	11 00
4	2 10/32 inches	100	14 00
3	2 13/32 inches	100	16 00
2	2 15/32 inches	100	20 00
1	2 1/2 inches	100	30 00

THE LX SEWING MACHINE BELT HOOKS

NUMBER IN BOX 500 STYLE A



NUMBER IN BOX 500 STYLE B



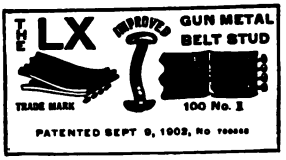
NUMBER IN BOX 500 STYLE C



PRICES PER 1,000 ANY STYLE

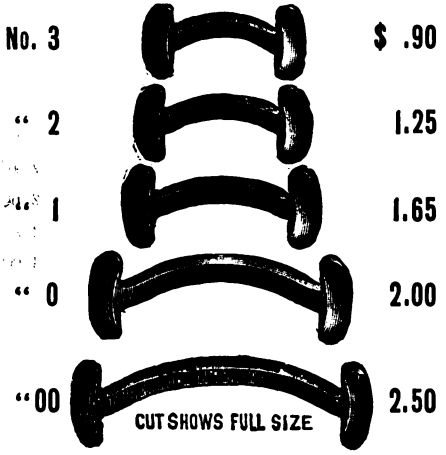
No. 17	No. 16	No. 15	No. 14
$2 00	$2 25	$2 50	$3 00

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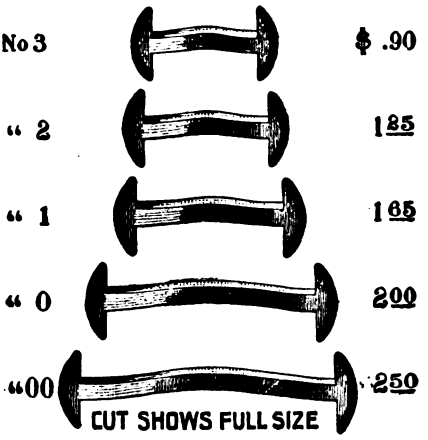
Reg. June 5, 1894. No. 24835.

PRICE PER BOX OF 100





PRICE PER BOX OF 100



They are the most practical belt fasteners made for leather or rubber belts running at a very high speed.

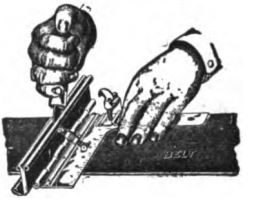
The LX Improved Gun Metal Belt Stud are the strongest belt stud made. No. 3 are for very thin belts No. 2 are for medium leather belts. No. 1 are for ordinary and heavy single Belts. No. 0 are for light double leather belts. No. 00 are for heavy double leather belts, and for 5 and 6-ply Rubber.



This is a tool of great convenience, a time saver, and does the work of two tools, heretofore required for this purpose. It is made of best material well finished, and first class in every respect. It is a very useful tool, and no one using a belt cutter should be without one.

PRICE $1.50 EACH

COMBINATION BELT SQUARE, CUTTER AND BEVELER COMBINED



Pat. Sept. 6, 1904.

This is a new and valuable tool, the only one of its kind. With it you can cut your belts the desired bevel for belt studs with one stroke of the knife. For this work the Square is indispensable, as the same results cannot be obtained in any other way. It is made of brass, nickel plated. The knife is made of best razor steel.

PRICE $5.00

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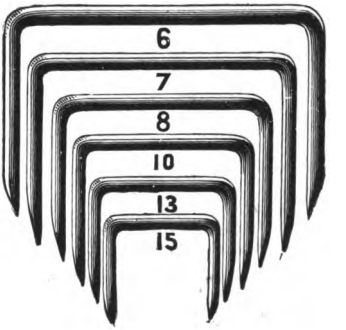
BUFFALO BELT FASTENERS.

SAVE HUNDREDS OF DOLLARS.

By enabling you to do your own repairing, riveting, splicing and making of belts out of the odd remnants about your factory.

These Fasteners are simplicity itself. A common hammer drives them home. The only fasteners known that can be applied without cutting or punching the belt. Also the only ones that can be used for fastening down the points of laps that are coming apart, in the center of laps as rivets, or for mending torn places in belting.

They are capable of standing an enormous tensile strain, while making a light, smooth, pliable joint that has been known to stand tests where all other fasteners have failed.



NET PRICE.

No. 15—1,000 in a box	$1.50	per 1,000	(For light single and very small belts.)	
No. 13—1,000 "	2.00	"	(For ordinary single belts and general use.)	
No. 10—1,000 "	2.50	"	(Extra heavy and wide single belts and small and light double ones.)	
No. 8— 500 "	3.50	"	(Ordinary double belts and wide 4-ply rubber and cotton.)	
No. 7— 250 "	4.00	"	(For extra heavy and wide double	
No. 6— 250 "	5.00	"	leather and rubber belts.)	

BRISTOL'S STEEL BELT LACING.



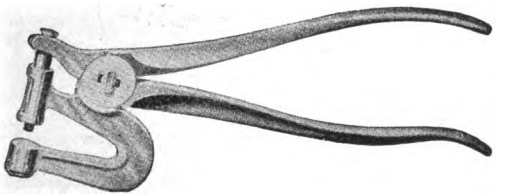
FOR LEATHER BELTS.

No. 00.	For Extra Light Belts, from 1-16 inch to ⅛ inch thick	Per box,	$1 00
" 0.	" Light Belts from ⅛ inch to 3-16 inch thick	"	1 00
" 1.	" Ordinary Single Leather Belts from 3-16 inch to ¼ inch thick	"	1 50
" 2.	" Extra Heavy and Wide Single Leather Belts from ¼ inch to 5-16 inch thick	"	2 00
" 3.	" Double Leather Belts from 5-16 inch to ⅜ inch thick	"	2 50
" 4.	" Heavy Double Leather Belts from ⅜ inch to 7-16 inch thick	"	3 00
" 5.	" Extra Heavy Double Leather Belts from 7-16 inch to 9-16 inch thick	"	3 50

FOR RUBBER, COTTON AND WOVEN BELTS.

No. 100.	For Lightest Rubber and Cotton Belts from 1-16 inch to ⅛ inch thick	Per box,	$1 10
" 10.	" 2-Ply Rubber and Cotton Belts from ⅛ inch to 3-16 inch thick	"	1 10
" 11.	" 3-Ply Rubber and Cotton Belts from 3-16 inch to ¼ inch thick	"	1 65
" 12.	" 4-Ply Rubber and Cotton Belts from ¼ inch to 5-16 inch thick	"	2 20
" 13.	" 5-Ply Rubber and Cotton Belts from 5-16 inch to ⅜ inch thick	"	2 75
" 14.	" 6-Ply Rubber and Cotton Belts from ⅜ inch to 7-16 inch thick	"	3 30
" 15.	" 7 and 8-Ply Rubber and Cotton Belts from 7-16 inch to 9-16 inch thick	"	3 85

All boxes packed with 100 inches of assorted lengths.



PATENT BELT PUNCH

Price each $1 50

Extra punches 50

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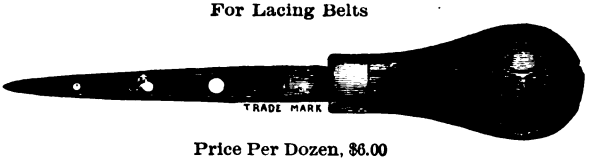


LX LACE CUTTER

Price, $6.00
Per Dozen

LOTHROP PATENT BELT AWLS

For Lacing Belts



Price Per Dozen, $6.00

LX IMPROVED STEEL BELT COUPLINGS



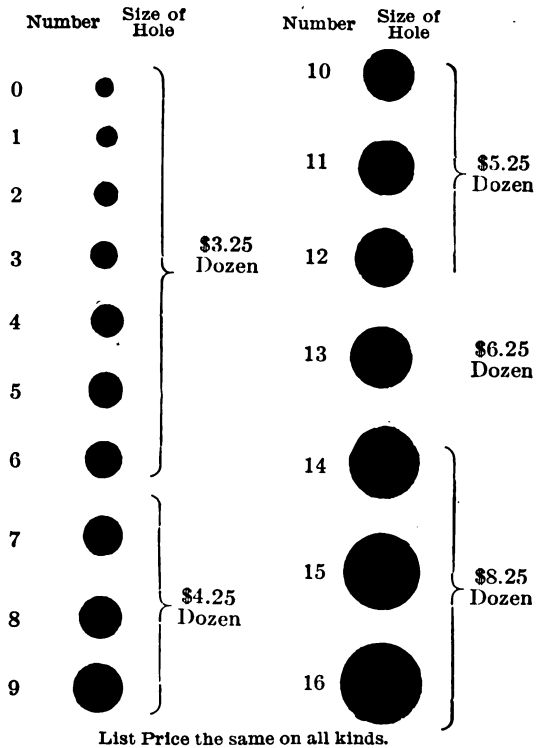
Size of Couplings	Price Per Dozen
1/8 in. Diam.	3 00
5/32 " "	3 00
3/16 " "	2 50
7/32 " "	2 50
1/4 " "	2 00
9/32 " "	2 50
5/16 " "	2 50
11/32 " "	3 00
3/8 " "	3 00
7/16 " "	3 50
1/2 " "	4 00
9/16 " "	5 00
5/8 " "	6 00
11/16 " "	7 50
3/4 " "	9 00
7/8 " "	13 00
1 " "	18 00
1 1/8 " "	22 00
1 1/4 " "	26 00

LX ROUND AND OVAL BELT PUNCHES



TRADE MARK

CARBON FINISH, PLAIN



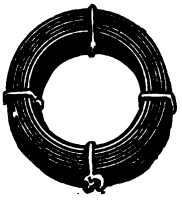
List Price the same on all kinds.

LX WIRE BELT LACE

SILVER COLOR

METALLIC OR RAINBOW

BRONZE COLOR



The LX Composition Wire Belt Lace and the Metallic or Rainbow Bronze or Iridescent colors are made in four sizes and sold at $2.00 per hundred feet for all four sizes. Each size is packed in boxes containing 50 feet, as follows:

No. 0. For belts from one inch to two and a half inches.
No. 1. For single belts five inches and under.
No. 2. For all single belts wider than five inches; also for all double belts under eight inches.
No. 3. For all double belts above eight inches in width.
All sizes, price per 100 feet, $2.00

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BELT CUTTER
NEW PATTERN

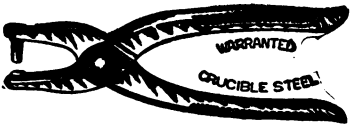
For slotting belts to adjust Belt Studs. Price, ea. $0 90

PLIERS AND AWL COMBINED
NEW PATTERN

For inserting Belt Studs in belts. Price, each...$0 40

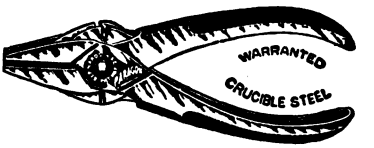


BELT PUNCH, NICKEL PLATED



Actual size, 7½ inches. Price, each$0 75

CUTTERS AND PLIERS, NICKEL PLATED



Actual size, 5½ inches. Price, each$0 75

MARKER FOR GAUGING DISTANCES OF HOLES



Actual size, 5½ inches. Price, each$0 25

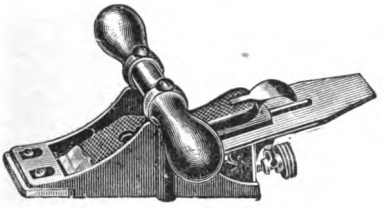
BELT GROOVER



Actual size, 6 inches. Price, each$0 50

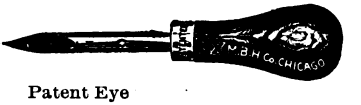
Price, Set:—Punch, Groover, Cutters and Pliers$1 50
Price, Set:—Punch, Special Groover, Cutters and Pliers and Belt Marker 2 00

L X BELT MAKERS' PLANE



2⅜ inch cutter. Price, each.....$2 50

L X IMPROVED BELT PUNCH
OR SPLICING TOOL
(This is a new Tool)



Patent Eye

This tool is a time and teeth saver. It will catch the lace, and pull it through the belt, when the lace only projects ¼ to ½ inch through the belt. Just think of it. It does the work quick and simple. Price, each.....$0 50

NOTE:—This tool is made with Lace Cutter Attachment.

(This is a new tool) (Combined)



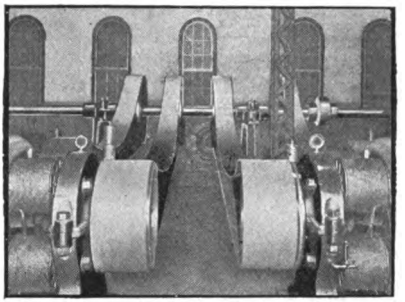
Patent Eye

L X IMPROVED BELT PUNCH AND LACE CUTTER
OR SPLICING TOOL

A tool which has long been needed. It does the work of two. Cuts the Lace Leather, punches the hole in the belt and draws the lace through. How can you afford to be without it? Once used always used. Price, each$1 00

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CLING-SURFACE BELT DRESSING



Cling-Surface is a belt filler and preservative, but its results are so far reaching that belt service with it costs less, does more and practically reaches perfect surface. It is the "slack-belt method." Its use keeps a belt or rope pliable, clean and preserved, doubling its life or more. It is not sticky. It penetrates the belt or rope where most needed. Besides this it absolutely stops slipping so that all belts can be run easy or slack, freed from the dead drag of tightening strain, carry fullest loads and not slip. Use Cling-Surface for leather or cotton belts, (painted or unpainted) Gandy, Leviathan, Carton, Sawyer, camel-hair, rubber or rope.

CARNEGIE STEEL COMPANY
HOMESTEAD WORKS

Munhall, Pa., November 12, 1901.

GENTLEMEN:

In reply to your request of October 30th, I give below our experience with Cling-Surface. In June 1900, we had the 12 inch belts on 7-80 Brush Arc machines stretched as far as the tightening slide would allow, at which point the belts would have to be shortened.

We were using a belt dressing at that time, but still had to carry our belts so tight so as to run the risk of hot bearings. We then began experimenting with Cling-Surface and several kinds of dressing. Cling-Surface, giving the best results, was adopted. We are now running the same belts, which have not yet been shortened, slacked up so that they sag within about 8 inches of tight side when loaded, giving the maximum wrap on pulley and minimum side pull on bearings.

Are well satisfied with results obtained and feel free to recommend Cling-Surface to all belt users. Yours very truly,

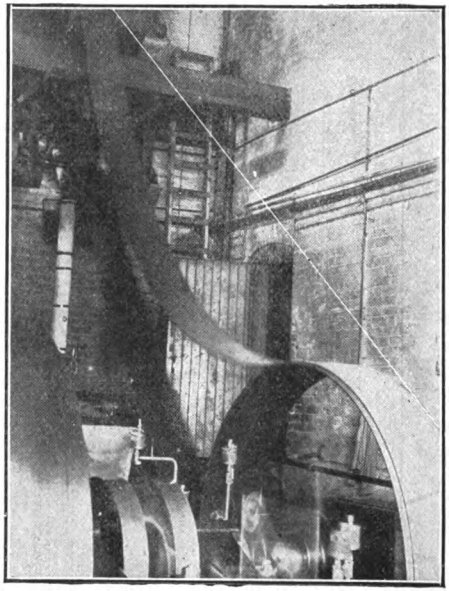
S. S. WALES,
Supt. Electric Department.

NOTE—They have used Cling-Surface continuously to present time and are now using it.

In 10, 25 and 50 lb. cans, price, per lb.....$0 35

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ANTI-SLIP BELT PRESERVATIVE



You can run your machinery with SLACK BELTS if you use ANTI-SLIP.

Slack belts mean less friction trouble, machinery repairs, belt repairs, saves power, delays and shut downs.

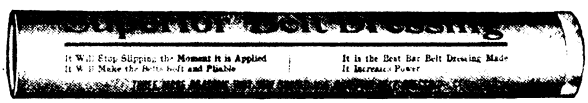
Increases your output.

ANTI-SLIP penetrates your leather belts and lubricates the fibres, making them soft and pliable. Makes 'em wear longer. It will lubricate the thread and yarns of your canvas belts and prevent their chafing. Also good for transmission rope. More ANTI-SLIP used in Michigan than any other belt dressing. In 5, 10, 25, and 50 lb. cans.

Price, per lb.....$0 35

"SUPERIOR" BAR BELT DRESSING

FOR LEATHER BELTING



The "19 Ounce Metal End Bar."

It will stop slipping the moment it is applied.

It is the best Bar Belt Dressing made.

Is always ready for use. Increases power.

It is an inch longer than any other dressing. You know it is almost impossible to use up the last inch of a bar. We give you an extra inch to save this loss, which means three cents or more.

It has 19 ounces of dressing. Other bars have only 16 ounces, and some even less.

It has a metal cap which protects the bar when not in use.

Price, per bar.....$0 40

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STANDARD PRICE LIST OF STEEL SHAFTING

For bars 1 foot to 24 feet long inclusive; per foot and pound up to 5 inches diameter; also weight per foot up to and including 24 inches diameter.

Shaft Sizes Inches	Weight per Foot	Price Per Foot	Price Per Pound	Shaft Sizes Inches	Weight per Foot	Price Per Foot	Price Per Pound	Shaft Sizes Inches	Weight per Foot
3/16	.094	$0 01	$0 100	2 11/16	19 29	$0 97	$0 050	5 5/8	84.49
1/4	.167	.02	.100	2 3/4	20.20	1 02	.050	5 11/16	86.38
5/16	.261	02	.085	2 13/16	21 12	1.06	.050	5 3/4	88.29
3/8	.376	.03	.070	2 7/8	22.07	1 11	.050	5 7/8	92.17
7/16	.511	.04	.070	2 15/16	23.04	1 16	.050	5 15/16	94.14
1/2	.668	05	.070	3	24.03	1 21	.050	6	96.14
9/16	.845	.06	.060	3 1/16	25.04	1 31	.0525	6 1/16	102.20
5/8	1 043	.07	.060	3 1/8	26 08	1 37	.0525	6 1/4	104.30
11/16	1.262	08	.060	3 3/16	27.13	1 43	.0525	6 7/16	110.70
3/4	1.502	.09	.055	3 1/4	28.20	1.49	.0525	6 1/2	112 80
13/16	1.763	.10	.055	3 5/16	29 30	1 54	.0525	6 11/16	119.40
7/8	2.044	.12	.055	3 3/8	30 42	1 60	.0525	6 3/4	121 70
15/16	2.347	.13	.055	3 7/16	31.56	1 66	.0525	6 15/16	128 50
1	2.670	.15	.055	3 1/2	32.71	1 81	.055	7	130.90
1 1/16	3.014	.17	.055	3 9/16	33.90	1.86	.055	7 1/2	150 20
1 1/8	3.379	.19	.055	3 5/8	35.09	1.94	.055	8	171.00
1 3/16	3.766	.21	.055	3 11/16	36.31	2.01	.055	8 1/2	193.00
1 1/4	4.173	.23	.055	3 3/4	37.56	2.07	.055	9	216 30
1 5/16	4.600	.26	.055	3 13/16	38.81	2.13	.055	9 1/2	241.00
1 3/8	5.019	.28	.055	3 7/8	40.10	2.20	.055	10	267.00
1 7/16	5.518	.31	.055	3 15/16	41.40	2.27	.055	10 1/2	294.40
1 1/2	6.008	.31	.050	4	42.73	2.57	.060	11	323.10
1 9/16	6.520	.33	.050	4 1/8	45.44	2 73	.060	11 1/2	353.10
1 5/8	7.051	.36	.050	4 3/16	46.83	2.85	.060	12	384.60
1 11/16	7.604	.39	.050	4 1/4	48.24	2.90	.060	12 1/2	417.50
1 3/4	8.178	.41	.050	4 3/8	51.11	3.11	.060	13	451.50
1 13/16	8.773	.44	.050	4 7/16	52.58	3.16	.060	13 1/2	486.10
1 7/8	9.388	.47	.050	4 1/2	54.07	3.52	.065	14	523.70
1 15/16	10.02	.51	.050	4 5/8	57.12	3.71	.065	14 1/2	532.48
2	10.68	.54	.050	4 11/16	58.67	3.82	.065	15	601.20
2 1/16	11.36	.57	.050	4 3/4	60.25	3 96	.065	15 1/2	641.37
2 1/8	12.06	.61	.050	4 7/8	63.46	4.12	.065	16	684.00
2 3/16	12.78	.65	.050	4 15/16	65.10	4.26	.065	17	772.20
2 1/4	13.52	.68	.050	5	66.76	4.72	.070	18	865.70
2 5/16	14.28	.72	.050	5 1/8	70.14			19	964.60
2 3/8	15.07	.76	.050	5 3/16	71.86	All shafting above 5 inches diameter, prices upon application.		20	1068.80
2 7/16	15.86	.80	.050	5 1/4	73.60			21	1178.30
2 1/2	16.69	.84	.050	5 3/8	77 15			22	1293.20
2 9/16	17.35	.88	.050	5 7/16	78.95			23	1413.70
2 5/8	18.40	.93	.050	5 1/2	80.77			24	1539.00

EXTRAS.—For shafts 6 inches to 11¼ inches long, ½ cent per pound net extra. For shafts 3 inches to 5¼ inches long, 1 cent per pound net extra. For shafts shorter than 3 inches special prices will be quoted. For shafts over 24 feet long and less than 30 feet, ½ cent per pound net extra.

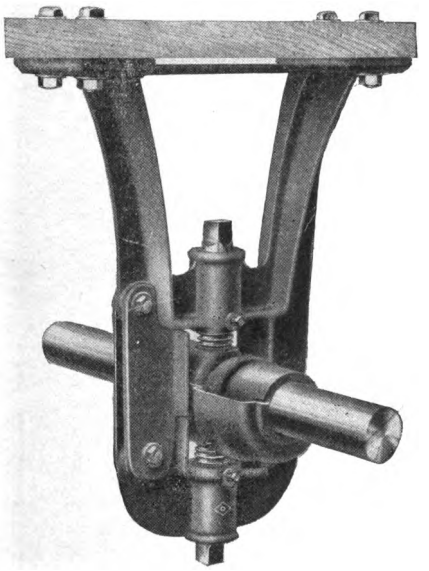
The above weights are for steel; iron will run about 2 per cent. lighter.

Boxing at cost.

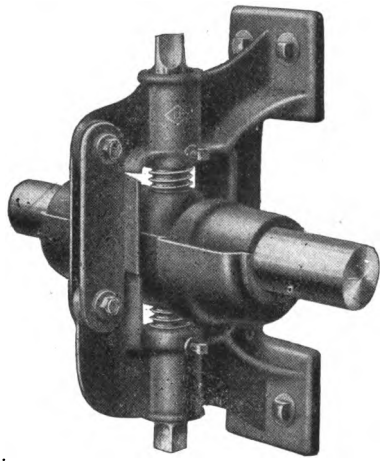
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DODGE SELF-OILING DROP AND POST HANGERS

Dodge Adjustable Ball-and-Socket Drop Hanger Frame, with Ring-Oiling Bearing



Adjustable Ball-and-Socket Post Hanger with Ring-Oiling Bearing



No other type of hanger embodies such beauty of design, strength, and facility for erecting.

Open side with double brace they combine all the essentials of a parted yet solid frame, machine finished base and adjusting plunger screws, true ball and socket connection with bearing and ample adjustment.

These hangers are furnished either with Standard, Capillary, Ring, Chain or Wick-Oiling Bearings.

The Standard Bearing is a substantial bearing for general service.

Capillary Bearing conveys only clean oil to the shaft by the well-known principle of capillary attraction.

Ring and Chain Bearings maintain a copious flow of oil directly from reservoir to top of shaft, whence it flows by gravity entire length of bearing surface.

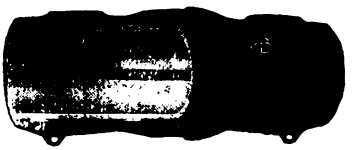
Wick-Oiling Bearing has an oil reservoir at top from which by means of a wick the shaft is lubricated entire length of bearing.

All bearings are shown on following page, and are babbitted, bored true to shaft, and are faced on ends for collar.

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DODGE LINE OF ADJUSTABLE BALL AND SOCKET DROP HANGERS

Standard Bearing



With Standard and Self-Oiling Bearings

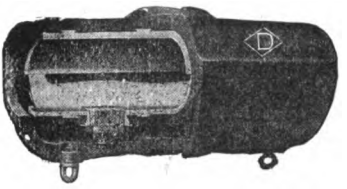
Wick-Oiling



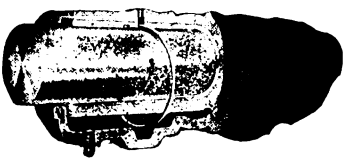
Frame



Capillary-Oiling



Ring or Chain Oiling

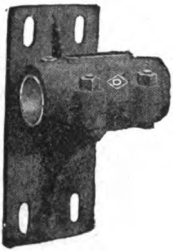


Size of Shaft and Type of Bearing		Drop in Inches									
		8″	10″	12″	14″	16″	18″	20″	21″	30″	36″
1 3/16″	Standard	$ 3.95	$ 4.10	$ 4.30	$ 4.55						
	Wick-Oiling	4.15	4.30	4.50	4.75						
	Capillary	4.95	5.10	5.30	5.55						
	Ring or Chain	5.15	5.30	5.50	5.75						
1 7/16″	Standard	4.90	5.05	5.25	5.50	$ 5.60	$ 6.00	$ 6.45			
	Wick-Oiling	5.25	5.40	5.60	5.85	5.95	6.35	6.80			
	Capillary	5.70	5.85	6.05	6.30	6.40	6.80	7.25			
	Ring or Chain	5.90	6.05	6.25	6.50	6.60	7.00	7.45			
1 11/16″	Standard	5.00	5.15	5.35	5.60	5.70	6.10	6.55			
	Wick-Oiling	5.35	5.50	5.70	5.95	6.05	6.45	6.90			
	Capillary	5.95	6.10	6.30	6.55	6.65	7.05	7.50			
	Ring or Chain	6.15	6.30	6.50	6.75	6.85	7.25	7.70			
1 15/16″	Standard	6.85	7.35	7.50	7.80	8.05	8.30	8.80	$ 9.65		
	Wick-Oiling	7.30	7.80	7.95	8.25	8.70	8.75	9.25	10.10		
	Capillary	8.75	9.25	9.40	9.70	9.95	10.20	10.70	11.55		
	Ring or Chain	9.00	9.50	9.65	9.95	10.20	10.45	10.95	11.80		
2 3/16″	Standard	8.70	9.05	9.20	9.70	10.30	10.75	11.65	13.35	$15.70	$18.25
	Wick-Oiling	9.25	9.60	9.75	10.25	10.85	11.30	12.20	13.90	16 25	
	Capillary	10.70	11.05	11.20	11.70	12.30	12.75	13.65	15.35	17.70	20.25
	Ring or Chain	10.95	11.30	11.45	11.95	12.55	13.00	13.90	15.60	17.95	20.50
2 7/16″	Standard	9.35	9.70	9.85	10.85	10.95	11.40	12.30	14.00	16.35	18.90
	Wick-Oiling	10.05	10.40	10.55	11.05	11.65	12.10	13.00	14.70	17.05	
	Capillary	11.30	11.65	11.80	12.30	12.90	13.35	14.25	15.95	18.30	20.85
	Ring or Chain	11.60	11.95	12.10	12.60	13.20	13.65	14.55	16.25	18.60	21.15
2 11/16″	Standard	10.85	11.35	11.85	12.35	13.35	14.45	15.50	17.75	19.80	20.55
	Wick-Oiling	11.65	12.15	12.75	12.85	14.15	15.25	16.30	18.55	20.60	21.35
	Capillary	13.45	13.95	14.45	14.95	15.95	17.05	18.10	20.35	22.40	23.15
	Ring or Chain	13.80	14.30	14.80	15.30	16.30	17.40	18.45	20.70	22.75	23.50
2 15/16″	Standard	12.80	13.30	13.80	14.30	15.30	16.40	17.45	19.70	21.75	22.50
	Wick-Oiling	13.95	14.45	15.05	15.15	16.45	17.55	18.60	20.85	22.90	23.65
	Capillary	16.20	16.70	17.20	17.70	18.70	19.80	20.85	23.10	25.15	25.90
	Ring or Chain	16.55	17.05	17.55	18.05	19.05	20.15	21.20	23.45	25.50	26.25
3 3/16″	Standard		16.40	16.95	17.70	18.20	19.60	21.50	24.70	27.80	30.30
	Wick-Oiling			18.35	19.10	19.60	21.00	22.90	26.10	29.20	31.70
	Capillary		24.70	25.25	26.00	26 50	27.90	29.80	33.00	36.10	38.60
	Ring or Chain		25.10	25.65	26.40	26.90	28.30	30.20	33.40	36.50	39.00
3 7/16″	Standard		16.85	17.40	18.15	18.65	20.05	21.95	25.15	28.25	30.75
	Wick-Oiling			18.80	19.55	20.05	21.45	23.35	26.55	29.65	32.15
	Capillary		27.05	27.60	28.35	28.85	30.25	32.15	35.35	38.45	40.95
	Ring or Chain		27.55	28.10	28.85	29.35	30.75	32.65	35.85	38.95	41.45
3 11/16″	Standard		22.85	23.40	23.90	26.05	26.80	28.70	33.95	37.40	41.95
	Wick-Oiling			25.45	25.95	28.10	28.85	30.75	36.00	39.45	44.00
	Capillary		30.45	32.00	32.50	34.65	35.40	37.30	42.55	46.00	50.55
	Ring or Chain		31.00	32.55	33.05	35.20	35.95	37.85	43.10	46.55	51.10
3 15/16″	Standard		26.10	26.65	27.15	29.30	30.05	31.95	37.20	40.65	45.20
	Wick-Oiling			29.35	29.85	32.00	32.75	34.65	39.90	43.35	47.90
	Capillary		32.20	33.75	34.25	36.40	37.15	39.05	44.30	47.75	52.30
	Ring or Chain		32.80	34.35	34.85	37.00	37.75	39.65	44.90	48.35	52.90

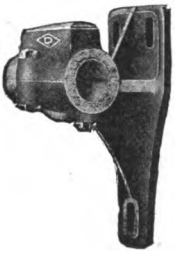
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DODGE LINE OF RIGID POST BOXES

Standard



Wick-Oiling



Capillary, Ring or Chain Oiling

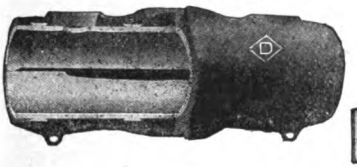


Kind of Bearing	Shaft Sizes													
	1 7/16"	1 11/16"	1 15/16"	2 3/16"	2 7/16"	2 11/16"	2 15/16"	3 3/16"	3 7/16"	3 11/16"	3 15/16"	4 3/16"	4 7/16"	4 15/16"
Standard	$3.60	$4.10	$5.45	$7.25	$ 8.35	$ 9.15	$10.35	$12.70	$14.10	$18.40	$22.40	$27.15	$31.90	$40.10
Wick-Oiling	4.15	4.55	5.80	6.95	8.00	9.75	11.70	13.35	17.80	22.35	27.10	29.35	32.85	45.00
Capillary	4.40	5.05	6.70	8.80	11.35	14.30	17.60	21.00	24.35	28.00	31.50			
Ring or Chain	4.70	5.35	7.00	9.10	11.65	14.65	17.95	21.40	24.85	28.55	32.10	38.50	45.00	51.45

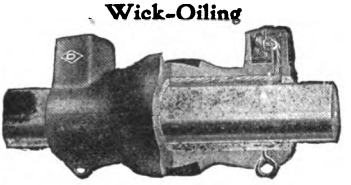
Adjustable Ball and Socket Post Hangers

For Standard and Self-Oiling Bearings.

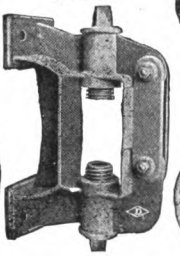
Standard Bearing



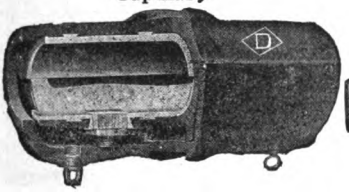
Wick-Oiling



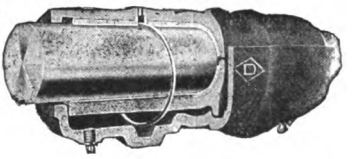
Frame



Capillary



Chain or Ring



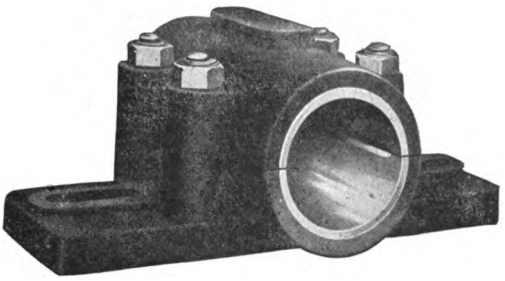
Kind of Bearing	Shaft Sizes												
	1 5/16"	1 3/16"	1 7/16"	1 11/16"	1 15/16"	2 3/16"	2 7/16"	2 11/16"	2 15/16"	3 3/16"	3 7/16"	3 11/16"	3 15/16"
Standard	$ 4.40	$ 4.50	$ 5.50	$ 5.60	$ 7 15	$ 9.75	$10.40	$13.00	$14.95	$19.00	$19.45	$25.45	$28.70
Wick-Oiling		4.70	5.85	5.95	7.60	10.30	11.10	13.80	16.20	20.40	20.85	27.50	31.25
Capillary	5.35	5.50	6.30	6.55	9.05	11.75	12.35	15.60	18.35	27.30	29.65	34.05	35.80
Ring or Chain		5.70	6.50	6.75	9.30	12.00	12.65	15.95	18.70	27.70	30.15	34.60	36.40

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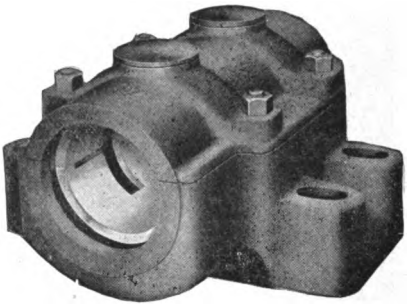
PILLOW BLOCKS

STANDARD

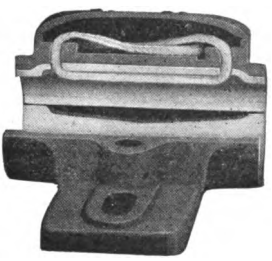
For Shafts 2¾ Inch and Up. These Bearings Have Two Bolts. For Shafts Under 2¾ Inch, One Bolt.

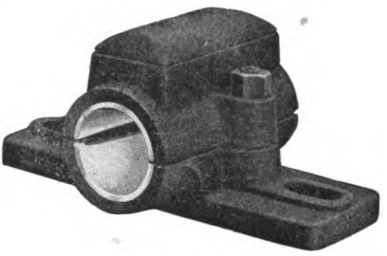


SELF-OILING



WICK-OILING



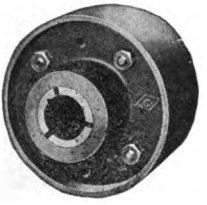


Shaft Size, Inches	Price Standard	Price Self-Oiling.	Price Wick-Oiling
1 5/16	$ 1.30	$	$
1 3/8	1.60	4.50	1.80
1 7/16	2.10	5.00	2.30
1 1/2 1/16	2.70	5.70	3.00
1 1/2 5/16	3.70	6.80	4.00
2 3/16	4.60	8.20	5.00
2 7/16	5.50	9.80	6.00
2 1/2 1/16	7.00	12.00	7.40
2 1/2 5/16	8.80	14.00	9.50
3 3/16	11.00	18.00	11.60
3 7/16	12.80	22.00	13.80
3 1/2 1/16	14.40	27.00	
3 1/2 5/16	16.00	32.00	
4 3/16	18.50	37.00	
4 7/16	21.00	42.00	
4 1/2 1/16	24.00	48.00	
4 1/2 5/16	27.00	54.00	

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DODGE LINE OF SHAFTING AND APPURTENANCES

Keyless Coupling



Split Safety Collar



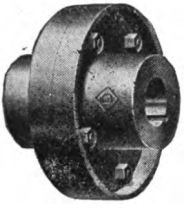
Square Jaw Clutch Coupling



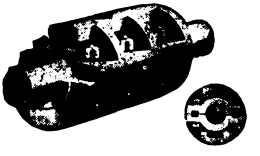
Ribbed Compression Coupling



Flange Coupling



"Grim Death" Coupling

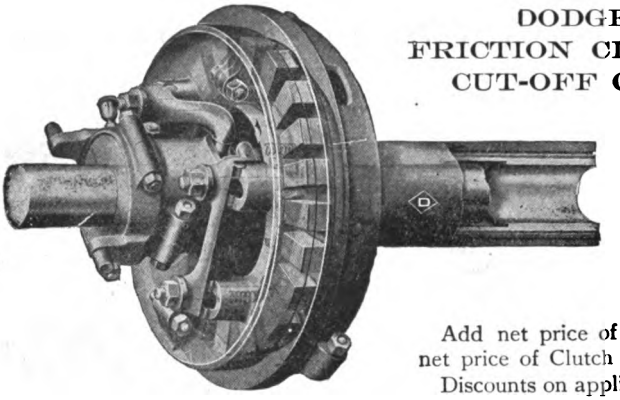


Spiral Jaw Clutch Coupling



For Shaft Size	APPURTENANCES								
	Dodge Keyless Coupling	Safety Collar		Ribbed Compression Couplings	Grim Death Couplings	Flange Couplings		Square or Spiral Jaw Coupling	
		Solid	Split			With Key. Not Fitted	Price Fitted	Price per pair Fitted	Price per pair Not Fitted
1 5/16		$ 0 65	$ 0 95						
1 3/16	$ 4 75	80	1 20	$ 3 05	$ 4 75	$ 7 50	$ 9 90	$11 50	$ 8 50
1 7/16	5 50	1 00	1 50	4 20	5 50	8 00	10 50	13 50	9 50
1 11/16	6 25	1 20	1 80	6 30	6 25	8 50	11 10	14 25	10 00
1 15/16	8 00	1 40	2 10	7 40	8 00	9 00	11 75	15 15	10 65
2 3/16	9 00	1 60	2 40	9 00	9 00	10 50	13 40	17 50	13 00
2 7/16	10 75	1 80	2 70	10 00	10 75	12 50	15 60	21 15	16 65
2 11/16	13 00	2 10	3 15	11 00	13 00	15 25	18 50	25 65	20 90
2 15/16	16 00	2 40	3 60	13 00	16 50	18 25	21 75	30 15	25 15
3 3/16		2 70	4 05	16 50	20 00	21 75	25 75		
3 7/16		3 00	4 50	20 00	23 00	25 25	29 75	39 90	32 40
3 11/16		3 30	4 95	24 00	26 00	29 25	34 25		
3 15/16		3 60	5 40	28 00	30 00	33 25	39 25	52 00	42 25
4 3/16		4 15	6 25			38 25	45 00		
4 7/16		4 70	7 05	38 00	42 00	43 25	51 25	68 75	55 25
4 11/16		5 30	7 95			49 00	57 75		
4 15/16		5 90	8 85		55 00	54 75	64 75		

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DODGE SPLIT FRICTION CLUTCHES AND CUT-OFF COUPLINGS

Clutches with Sleeves for Pulleys, and Sheaves of width of face as indicated in list. For Sprockets and Gears, use the narrowest face listed.

Add net price of Pulley, Sheave, etc., to net price of Clutch and Sleeve.

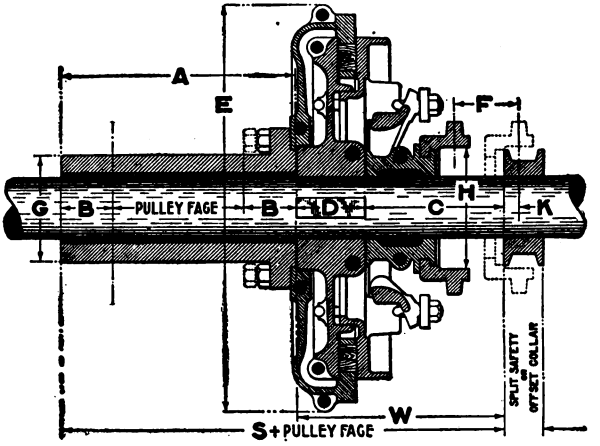
Discounts on application.

Size of Clutch in Inches	H.P. at 100 R.P.M.	Shaft Size in Inches	Face of Pulley in Inches								Cut-off Couplings Complete
			6″	8″	10″	12″	14″	16″	18″	20″	
10″	6	1 3/16—1 15/16	$46.10	$47.40	$48.75						$49.00
		2 3/16—2 7/16	47.65	49.15	50 70						
12″	10	1 3/16—1 15/16	53.10	54.40	55.75	$57.05					56.00
		2 3/16—2 7/16	54.65	56.15	57.70	59.20					
		2 11/16—2 15/16	56.00	57.60	59.30	60.90					
14″	15	1 7/16—1 15/16	62.75	64.10	65.40	66.75	$67.75				66.00
		2 3/16—2 7/16	64.40	65.90	67.50	69.00	70.10				
		2 11/16—2 15/16	65.80	67.50	69.10	70.70	71.90				
		3 3/16—3 7/16	67.48	69.30	71 20	73.00	74.40				
16″ ..	20	1 15/16	78.25	79.60	80.90	82.25	83.25				82.00
		2 3/16—2 7/16	79.90	81.40	83.00	84.50	85.60	$86.40			
		2 11/16—2 15/16	81.30	83.00	84.60	86.20	87.40	88.20			
		3 3/16—3 7/16	82.98	84.80	86.70	88.50	89.90	90.80			
		3 11/16—3 15/16	85.60	87 60	89.60	91.60	93 10	94.10			
18″ ...	25	2 3/16—2 7/16	99.90	101.40	103.00	104.50	105.60	106.40			102.00
		2 11/16—2 15/16	101.30	103.00	104.60	106.20	107.40	108.20	$109.00		
		3 3/16—3 7/16	102.98	104.80	106.70	108.50	109.90	110.80	111.75		
		3 11/16—3 15/16	105.60	107.60	109.60	111.60	113.10	114.10	115.10		
		4 3/16—4 7/16	107.80	110.00	112.20	114.40	116.05	117.15	118.25		
20″	32	2 7/16		121.40	123.00	124.50	125.60	126.40			124.00
		2 11/16—2 15/16		123.00	124.60	126.20	127.40	128.20	129.00	$129.80	
		3 3/16—3 7/16		124.80	126.70	128.50	129.90	130.80	131.75	132.65	
		3 11/16—3 15/16		127.60	129.60	131.60	133.10	134.10	135.10	136.10	
		4 3/16—4 7/16		130.00	132.20	134.40	136.05	137.15	138.25	139.35	
		4 11/16—4 15/16		132.85	135.35	137.85	139,75	141.00	142.25	143.50	
		5 3/16—5 7/16		138.15	141.05	143.95	146.15	147.60	149.05	150.50	
22″	40	2 11/16—2 15/16			149.60	151,20	152.40	153.20	154.00	154.80	150.00
		3 3/16—3 7/16			151.70	153.50	154.90	155.80	156.75	157.65	
		3 11/16—3 15/16			154.60	156.60	158.10	159.10	160.10	161.10	
		4 3/16—4 7/16			157.20	159.40	161.05	162.15	163.25	164.35	
		4 11/16—4 15/16			160.35	162.85	164.75	166.00	167.25	168.50	
		5 3/16—5 7/16			166.05	168.95	171.15	172.60	174.05	175.50	
24″	50	2 15/16				171.20	172.40	173.20	174.00	174.80	172.00
		3 3/16—3 7/16				173.50	174.90	175.80	176.75	177.65	
		3 11/16—3 15/16				176.60	178.10	179.10	180.10	181.10	
		4 3/16—4 7/16				179.40	181.05	182.15	183.25	184.35	
		4 11/16—4 15/16				182.85	184.75	186.00	187.25	188.50	
		5 3/16—5 7/16				188.95	191.15	192.60	194.05	195.50	
		5 11/16—5 15/16				195.05	197.55	199.20	202.50	204.15	

Price List or 30″, 36″, 42″, 48″, 54″, and 60″ Split Clutches, with Sleeves, Quills, and for Cut-off Couplings, on application. Complete Price List in large catalogue.

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DIMENSIONS DODGE SPLIT FRICTION CLUTCHES



Clutch Sizes	A	B	C	D	E	F	G	H	K	S	W
10	Pulley face + 2 B = total length of sleeve.	2½	6⅞	3¾	14	2¼		4½	1	15⅝	10⅝
12		2½	7 3/16	3¾	17	2⅝		4 9/16	1 1/16	16 9/16	11 9/16
14		2½	8½	4¼	19	3		5 15/16	1 1/16	17¾	12¾
16		3	8¾	4¼	21	3		5 15/16	1 5/16	19	13
18		3	8⅞	4⅛	23	3⅝		7	1 3/16	19	13
20		3	8¾	4 13/16	25½	3⅝		7 13/16	1	19 9/16	13 9/16
22		3	9⅛	4⅝	27	4		8¼	1 3/16	19¾	13¾
24		3	9⅝	4¾	29¼	4⅜		8 9/16	1 9/16	20⅜	14⅜
28		3½	11	5½	34¼	5		9¾	1 1/16	23½	16½
30		3½	11½	7¼	34	6½		9¾	1 1/16	25¾	18¾
36			11	7⅞	40¼	7		11 1/16	1 1/16		18⅞
42			11⅞	9½	48	8⅛		11¾	1½		21⅜
48			13⅝	11	54	9⅜		14⅜	1⅝		24⅝
54			16	12⅜	60½	11		14¾	1⅝		28⅜
60			16½	13⅝	67¾	11		14¾	1⅝		30⅛

NOTE.—For clutches over 30 inches we recommend quills in place of sleeves.

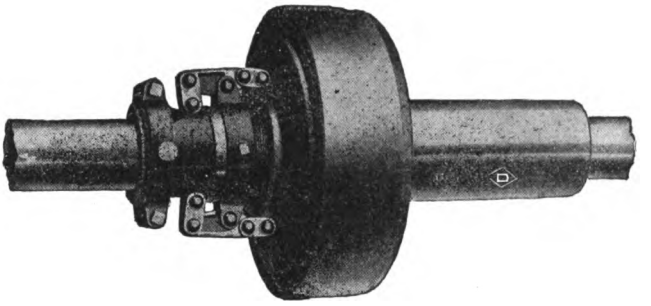
When clutches are bored near the maximum shaft size, the regular split collar is of a diameter greater than the H dimension of F ring, here shown, and necessitates the use of an off-set collar.

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DODGE SOLID FRICTION CLUTCHES AND CUT-OFF COUPLINGS

Are Self-Contained, Perfectly Balanced, Multiple Frictional Grip, and Ample Friction Surface.

Prices include Standard Sleeves.



Size of Clutch	Largest Bore	Special Bore	H.P. at 100 R.P.M.	Will Drive Pulley		Price	Size of Clutch	Largest Bore	Special Bore	H.P. at 100 R.P.M.	Will Drive Pulley		Price
				Diam.	Face						Diam.	Face	
4″	1″	..	1½	12″	4″	$15.00	9″	2½″	..	6	30″	6″	$30.00
5″	1½″	..	2	15″	4″	17.00	10″	2¾″	.	10	30″	10″	37.00
6″	1⅝″	..	3	16″	5″	20.00	12″	3″	4″	15	36″	12″	45.00
7″	2″	..	4	20″	6″	22.00	14″	3½″	5″	20	40″	14″	55.00
8″	2″	..	5	21″	6″	27.00	16″	4½″	6″	25	48″	14″	75 00

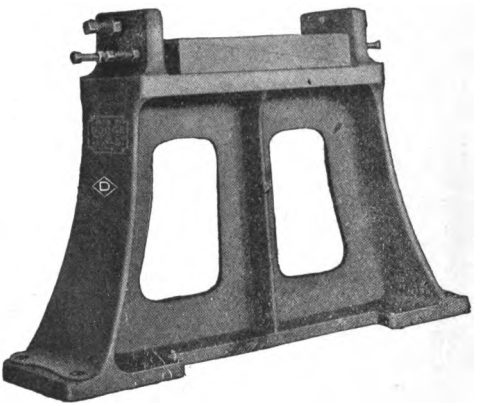
To ascertain price of Clutch Pulley, add net cost of Pulley of the required size to proper size Clutch at net cost. This rule also applies to Gears, Sheaves, Sprockets, etc. No charge made for fitting.

DODGE ADJUSTABLE FLOOR STANDS

We make a wide variety of Floor Stands for use in electrical jack shaft and water-works service.

The Stand shown is designed to give ample strength, weight, and base area for the respective shaft sizes, being especially adapted to heavy duty and high speed service.

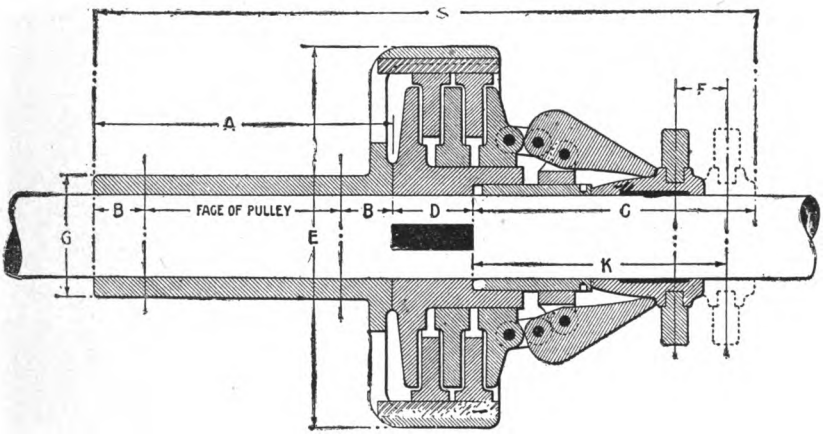
Prices upon application. State height from center of shaft to floor line.



From an economical standpoint, BELT CONVEYORS cost less and wear longer than any other means for carrying coal, coke, gravel, ashes, cement, salt, dirt, etc. Tell us your requirements.

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DIMENSIONS DODGE SOLID FRICTION CLUTCHES



Size of Clutch	Largest Shaft		A	B	C	D	E	F	G		K	S
	Reg.	Specl.							Reg.	Specl.		
4	1¼	...	4½	¼	4¾	1½	5⅜	¾	2 3/16	...	4⅜	10¾
5	1½	...	5	½	4¾	1¾	6½	¾	2 7/16	...	4⅜	11½
6	1¾	...	6	½	6¾	1⅞	7 11/16	1¼	2 11/16	...	5⅞	14¼
7	2	...	7	½	6⅞	2⅛	8⅞	1¼	2 15/16	...	6⅜	16
8	2¼	...	8	1	7½	2¼	10⅛	1½	3 3/16	...	7	17¾
9	2½	...	10	2	7⅝	2⅜	11⅜	1½	3 11/16	...	7	20
10	2¾	...	11	2	7½	2½	12⅝	1	4¼	...	6⅞	21
12	3	4	12	2	8½	2¾	15⅛	1¼	4½	5½	7¾	23¼
14	3½	5	13	2½	9	3	17⅝	1¼	5	6½	8⅛	25
16	4½	6	14	2½	9⅞	3⅛	19½	1½	6	7½	9	27

Sleeve length A should be equal to width of pulley face plus twice B. Table shows standard length A regularly furnished unless otherwise specified. For other lengths, proper correction of total space on shaft S should be made.

Clutches 12 inches and larger may be specially bored for shafts larger than regular maximum as per third column of table. Special sleeve diameters G apply to these special bores.

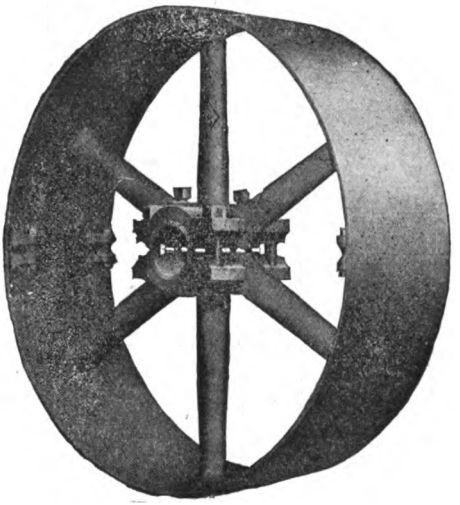
Clutches 9 inches and smaller have the taper sliding collar as shown; sizes 10 inches and larger have toggle mechanism except when operated in duplex.

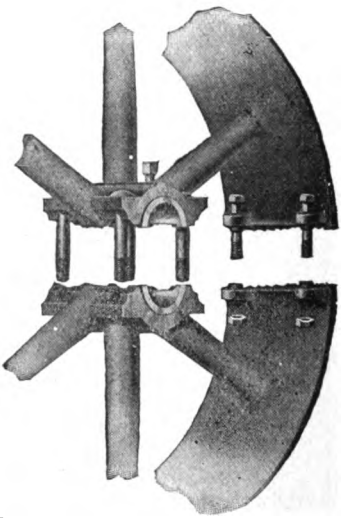
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THE STANDARD IRON SPLIT PULLEY

WITH INTERCHANGEABLE BUSHINGS

All sizes. Prompt shipments.
See price list on opposite page





ENLARGED VIEW OF HUB, SHOWING IRREGULAR FRACTURE AND MATING EDGES OF RIM

All bushes are made and finished whole, and so remain until they are required for use upon the shaft. They are then split into halves by forcing an ordinary chisel into one of the two oblong slots in each bush, as shown in cut, separating the connecting metal at the ends of each slot.



METHOD OF CRACKING BUSH

The fractured edges are dressed away slightly to provide for clamping clearance. The bush halves, one pair, are then placed in each end of the hub.

The projecting trunnions of the bushes engage the apertures of the hub bore, and the bushed pulley is then ready to be clamped in place upon the shaft.



SPLIT UNSPLIT

One pair of bushings is furnished without charge with each stock pulley. When pulleys are ordered bored to fit the shaft, no bushings are furnished.

Key seating and keys are extra.

Standard Bores are as follows.

Diameter		Diameter	
6 to 9 inches (inclusive),	bore $2\frac{7}{16}$	$24\frac{1}{2}$ to 36 inches (inclusive)	bore, $3\frac{7}{16}$
$9\frac{1}{2}$ to 24 " "	" $2\frac{15}{16}$	37 to 54 " "	" $3\frac{15}{16}$

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PRICE LIST
STANDARD IRON SPLIT PULLEYS
AND THE
REGULAR IRON SPLIT PULLEY

SINGLE BELT—Width Face												DOUBLE BELT—Width Face											
3	4	5	6	7	8	9	10	12	14	16	Dia.	3	4	5	6	7	8	9	10	12	14	16	
$3.25	$3.85	$4.05	$4.20								6	$3.85	$4.55	$4.85	$5.20	$5.95	$6.30	$6.65	$7.00	$8.75			
3.40	4.00	4.25	4.50								7	4.05	4.75	5.10	5.45	6.20	6.60	7.00	7.40	9.20			
3.55	4.20	4.45	4.70	$5.25	$5.60						8	4.25	4.95	5.30	5.70	6.50	6.90	7.35	7.85	9.70	$10.85		
3.70	4.35	4.60	4.90	5.60	5.90	$6.25					9	4.45	5.20	5.55	6.00	6.80	7.25	7.75	8.25	10.20	11.40		
3.85	4.50	4.80	5.15	5.85	6.20	6.55	$6.90				10	4.65	5.45	5.85	6.30	7.15	7.65	8.15	8.70	10.75	12.00		
4.20	5.15	5.45	5.80	6.80	7.20	7.60	7.90				11	5.05	6.15	6.60	7.10	8.25	8.80	9.30	9.90	12.20	13.60		
4.85	5.35	5.70	6.05	7.05	7.40	7.80	8.20				12	5.25	6.40	6.90	7.45	8.65	9.20	9.80	10.40	12.75	14 10		
4.55	5.55	5.90	6.30	7.30	7.75	8.10	8.55				13	5.45	6.65	7.20	7.80	9.05	9.65	10.30	10.95	13.40	14.85		
4.75	5.75	6.10	6.55	7.55	8.05	8.45	8.95				14	5.70	6.90	7.50	8.15	9.40	10.05	10.75	11.45	14.00	15.60		
4.90	5.95	6.35	6.80	7.90	8.35	8.80	9.30	$11.50			15	5.90	7.20	7.85	8.50	9.80	10.50	11.25	12.00	14.70	16.35		
5.10	6.15	6.60	7.10	8.20	8.70	9.15	9.70	12.00			16	6.20	7.50	8.20	8.90	10.30	11.05	11.85	12.75	15.45	17.25	$20.40	
5.30	6.40	6.90	7.40	8.55	9.05	9.60	10.15	12.50			17	6.50	7.85	8.60	9.35	10.75	11.60	12.45	13.30	16.25	18.15	21.40	
5.50	6.65	7.15	7.70	8.90	9.45	10.00	10.60	13.10			18	6.75	8.15	8.95	9.80	11.20	12.15	13.05	13.95	17.05	19.10	22.45	
5.90	7.35	8.05	8.35	10.50	11.10	11.70	12.35	15.35			19	8.20	8.95	10.55	11.50	13.05	14.00	15.00	16.00	19.60	21.85	25.80	
7.10	7.60	8.95	9.60	10.90	11.55	12.20	12.90	16.00	$18.00		20	8.60	9.30	10.95	12.00	13.65	14.65	15.75	16.85	20.60	23.00	27.10	
7.35	7.90	9.25	9.95	11.30	12.00	12.70	13.45	16.65	18.80		21	8.80	9.65	11.40	12.50	14.25	15.35	16.50	17.70	21.60	24.15	28.40	
7.55	8.20	9.55	10.30	11.70	12.45	13.20	14.00	17.30	19.65		22	9.10	10.05	11.85	13.00	14.85	16.05	17.25	18.55	22.60	25.30	29.70	
7.80	8.45	9.90	10.65	12.10	12.90	13.70	14.55	18.00	20.45		23	9.35	10.40	12.30	13.50	15.45	16.75	18.05	19.40	23.60	26.45	31.05	
9.00	9.70	11.25	12.05	13.85	14.70	15.60	16.50	20.40	22.95		24	10.60	11.75	13.75	15.05	17.40	18.80	20.20	21.60	26.25	29.25	35.10	
9.80	10.50	12.05	13.00	14.85	15.95	16.90	18.00	22.25	24.90		26	11.40	12.75	14.85	16.30	18.80	20.30	21.80	23.40	28.35	31.80	38.10	
10.35	11.20	12.90	13.90	16.00	17.10	18.30	18.50	24.10	26.90		28	12.30	13.70	15.95	17.65	20.20	21.80	23.45	25.20	30.55	34.35	41.10	
11.20	12.15	13.85	14.95	17.15	18.40	19.70	21.15	25.85	28.80		30	13.20	14.70	17.10	18.95	21.60	23.40	25.20	27.00	32.75	36.95	44.20	
12.95	13.90	16.05	17.25	19.70	21.15	22.65	24.15	30.35	33.50		32	14.15	16.70	19.70	21.05	24.65	26.60	28.95	30.60	37.80	42.45	50.45	
13.90	14.90	17.10	18.50	21.10	22.60	24.30	25.85	32.30	35.70		34	16.10	18.00	21.10	23.20	26.45	28.45	30.60	32.85	40.30	45.40	53.70	
14.90	15.90	18.25	19.70	22.45	24.10	25.85	27.60	34.30	37.90		36	17.25	19.25	22.55	24.80	28.20	29.85	32.75	35.05	42.90	48.35	57.05	
....	19.05	21.45	23.10	27.85	28.95	30.80	32.70	40.15	44.00		38		22.75	24.65	28.55	33.35	35.80	38.25	40.70	49.45	55.15	67.15	
....	20.20	22.80	24.60	28.80	30.70	32.65	34.65	42.30	46.40		40		24.25	27.80	30.40	35.40	38.00	40.60	43.20	52.25	58.80	68.90	
....	21.40	24.20	26.10	30.45	32.45	34.50	36.60	44.50	48.80		42		25.80	29.55	32.30	37.45	40.20	42.95	45.75	55.10	61.45	72.40	
....	22.75	25.70	27.75	32.20	34.35	36.50	38.70	46.90	$1.40		44		27.50	31.40	34.35	39.65	42.60	45.55	48.55	58.40	65.10	76.50	
....	24.15	27.20	29.35	33.95	36.25	38.50	40.95	49.80	54.10		46		29.25	33.30	36.40	41.90	45.05	48.25	51.45	61.70	68.80	80.60	
....	29.00	31.20	33.50	38.85	41.35	43.85	46.45	56.20	61.30		48		34.50	37.70	41.00	47.30	50.65	54.05	57.45	69.50	77.00	91.70	
....		32.80	35.30	40.75	43.25	45.80	48.45	58.80	64.20	$77.00	50			39.75	43.30	49.80	53.30	56.85	60.45	72.80	80.70	96.85	
....		34.50	37.10	42.95	45.80	48.00	50.75	61.80	67.30	80.90	52			41.85	45.65	52.30	56.00	59.75	63.50	76.15	84.45	100.05	
....		36.20	38.90	44.95	47.40	50.20	53.05	64.60	70.20	83.70	54			43.95	47.90	54.80	58.70	62.65	66.60	79.50	88.25	104.25	

Additional Price to be Added to the Price List for Tight and Loose Pulleys Per Pair, and Finished Flange Pulleys Each

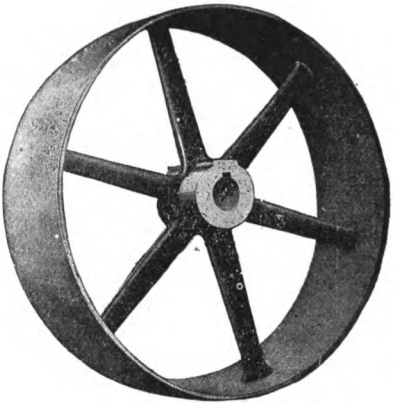
Diameter in Inches	Price Tight and Loose Pulleys	Price Flanged Pulleys	Diameter in Inches	Price Tight and Loose Pulleys	Price Flanged Pulleys
6 to 8	$1.60	$ 4.65	49 to 52	$ 9.30	$ 33.00
9 to 10	1.95	5.20	53 to 56	10.00	36.30
11 to 12	2.30	5.75	57 to 60	10.70	40.70
13 to 14	2.65	6.30	61 to 66	11.70	46.20
15 to 16	3.00	7.15	67 to 72	12.70	51.70
17 to 18	3.30	8.00	73 to 78	13.70	57.20
19 to 20	3.70	8.80	79 to 84	14.70	62.70
21 to 22	4.05	9.90	85 to 90	15.70	68.20
23 to 24	4.40	11.00	91 to 96	16.70	73.70
25 to 26	4.75	12.10	97 to 102	17.70	79.70
27 to 28	5.10	13.75	103 to 108	18.70	85.80
29 to 30	5.45	15.40	109 to 114	19.70	91.30
31 to 32	5.80	17.05	115 to 120	20.70	96.80
33 to 34	6.15	18.70	121 to 126	21.70	102.30
35 to 36	6.50	20.35	127 to 132	22.70	107.80
37 to 40	7.20	23.10	133 to 138	23.70	113.80
41 to 44	7.90	26.40	139 to 144	24.70	119.80
45 to 48	8.60	29.70			

Pulleys with one flange only, one-half that given above.
Pulleys with three flanges, one-half more than given above.
We are prepared to furnish iron friction wheels, winding drums, pulleys for special purposes, etc., on short notice and at reasonable prices.

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MACHINE MOULDED CAST IRON PULLEYS

PLAIN SOLID PULLEY

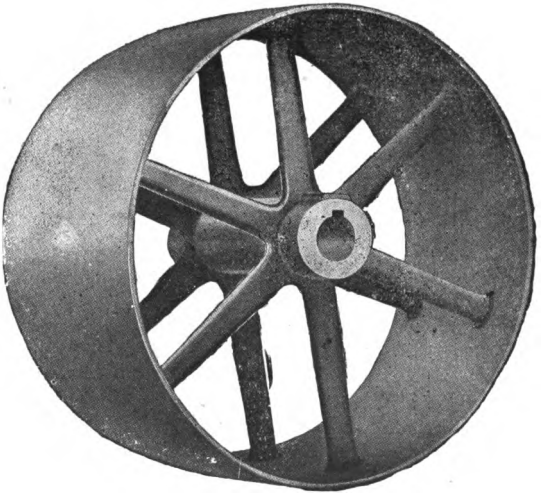


PLAIN SPLIT PULLEY

This pulley without split rim, is the regular clamp hub pulley



SOLID DOUBLE ARM PULLEY



We can also furnish

FLANGE PULLEYS

with flange in center, on one side or on both sides.

STEP CONE PULLEYS

with any number of steps.

TIGHT AND LOOSE PULLEYS

Pulleys for Special Purposes

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MACHINE MOULDED IRON PULLEYS

BORED, TURNED AND BALANCED, WITH SET SCREWS OR KEY-SEATS

SINGLE BELT

Diameter in Inches.	FACE IN INCHES.									
	3	4	5	6	7	8	9	10	11	12
6	1.95	2.10	2.30	2.55	2.80	3.05	3.30	------	------	------
7	2.10	2.25	2.50	2.75	3.00	3.25	3.55	3.85	------	------
8	2.25	2.45	2.70	2.95	3.20	3.45	3.80	4.15	------	------
9	2.40	2.60	2.85	3.15	3.45	3.75	4.10	4.45	------	------
10	2.55	2.75	3.05	3.40	3.70	4.05	4.40	4.75	5.10	------
11	2.70	2.95	3.25	3.60	3.95	4.35	4.65	5.05	5.40	------
12	2.85	3.15	3.50	3.85	4.20	4.55	4.95	5.35	5.75	6.20
13	3.05	3.35	3.70	4.10	4.45	4.90	5.25	5.70	6.15	6.60
14	3.25	3.55	3.90	4.35	4.70	5.20	5.60	6.10	6.55	7.05
15	3.40	3.75	4.15	4.60	5.05	5.50	5.95	6.45	6.95	7.50
16	3.60	3.95	4.40	4.90	5.35	5.85	6.30	6.85	7.40	8.00
17	3.80	4.20	4.70	5.20	5.70	6.20	6.75	7.30	7.90	8.50
18	4.00	4.45	4.95	5.50	6.05	6.60	7.15	7.75	8.40	9.10
19	4.25	4.70	5.25	5.85	6.45	7.05	7.65	8.30	9.00	9.75
20	4.45	4.95	5.55	6.20	6.85	7.50	8.15	8.85	9.60	10.40
21	4.70	5.25	5.85	6.55	7.25	7.95	8.65	9.40	10.20	11.05
22	4.90	5.55	6.15	6.90	7.65	8.40	9.15	9.95	10.80	11.70
23	5.15	5.80	6.50	7.25	8.05	8.85	9.65	10.50	11.45	12.40
24	5.40	6.10	6.85	7.65	8.45	9.30	10.20	11.10	12.10	13.15
25	5.70	6.50	7.25	8.10	8.95	9.90	10.85	11.85	12.90	14.05
26	6.00	6.90	7.65	8.60	9.45	10.55	11.05	12.60	13.75	15.00
27	6.35	7.30	8.15	9.05	10.00	11.10	12.20	13.35	14.60	15.90
28	6.75	7.70	8.50	9.50	10.60	11.70	12.90	14.10	15.45	16.85
29	7.25	8.10	9.00	10.00	11.15	12.35	13.60	14.90	16.30	17.70
30	7.60	8.55	9.45	10.55	11.75	13.00	14.30	15.75	17.15	18.60
31	8.05	8.95	9.95	11.10	12.35	13.70	15.10	16.55	18.05	19.55
32	8.45	9.40	10.45	11.65	12.95	14.40	15.90	17.40	19.00	20.55
33	8.90	9.90	11.00	12.25	13.60	15.05	16.70	18.25	19.90	21.50
34	9.40	10.40	11.50	12.90	14.35	15.85	17.55	19.10	20.85	22.50
35	9.90	10.90	12.10	13.50	15.00	16.60	18.25	19.95	21.75	23.50
36	10.40	11.40	12.65	14.10	15.70	17.35	19.10	20.85	22.70	24.50
38	------	12.55	13.95	15.60	17.95	19.05	20.90	22.80	24.75	26.65
40	------	13.70	15.30	17.10	18.90	20.80	22.75	24.75	26.80	28.80
42	------	14.90	16.70	18.60	20.55	22.55	24.60	26.70	28.85	31.00
44	------	16.25	18.20	20.25	22.30	24.45	26.60	28.80	31.10	33.40
46	------	17.65	19.70	21.85	24.05	26.35	28.60	30.95	33.40	35.80
48	------	19.00	21.20	23.50	25.85	28.25	30.65	33.15	35.70	38.20
50	------	------	22.80	25.30	27.75	30.25	32.80	35.45	38.10	40.80
52	------	------	24.50	27.10	29.65	32.30	35.00	37.75	40.50	43.40
54	------	------	26.20	28.90	31.65	34.40	37.20	40.05	43.00	46.00
56	------	------	------	30.85	33.55	36.30	39.25	42.25	45.45	48.75
58	------	------	------	32.80	35.50	38.35	41.35	44.55	47.95	51.50
60	------	------	------	34.80	37.50	40.35	43.45	46.85	50.45	54.20
	3	4	5	6	7	8	9	10	11	12

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MACHINE MOULDED IRON PULLEYS

BORED, TURNED AND BALANCED, WITH SET SCREWS OR KEY-SEATS

DOUBLE BELT

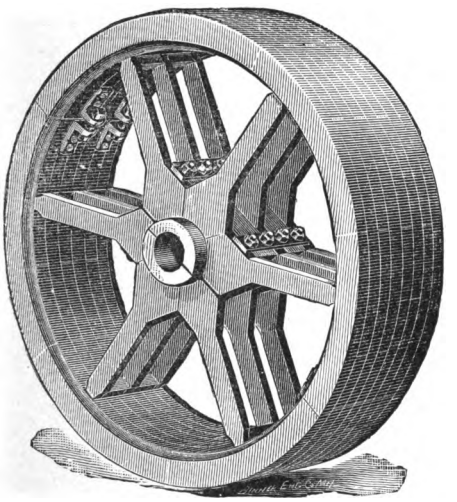
SINGLE AND DOUBLE ARM

Diam. in In.	SINGLE ARM. FACE IN INCHES.											DOUBLE ARM. FACE IN INCHES.					
	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30
10	4.10	4.55	5.00	5.50	6.00	6.55	7.10	7.65									
12	4.70	5.25	5.80	6.35	6.95	7.55	8.15	8.75	10.10								
14	5.30	5.95	6.55	7.20	7.90	8.60	9.30	10.00	11.60								
16	6.00	6.70	7.45	8.20	9.00	9.90	10.60	11.45	13.25	15.15							
18	6.75	7.60	8.45	9 30	10.20	11.10	12.05	13.05	15.10	17.20							
20	7.55	8.60	9.60	10.60	11.70	12.80	13.90	15.00	17.40	19.80	22.40	28.75	31.85	35.20	38.60	42.15	47.10
22	8.45	9.60	10.80	12.00	13.20	14.50	15.75	17.00	19.70	22.40	25.40	32.55	36.25	40.00	43.85	47.85	52 00
24	9.35	10.65	12.00	13.40	14.80	16.20	17.65	19.00	22.00	25.10	28.40	36.45	40.70	44.95	49.10	53.60	58.35
26	10.45	11.90	13.40	14.90	16.40	18.00	19.60	21.10	24 55	28.10	31.80	40.85	45.70	50.00	54.50	59.25	63.85
28	11.55	13.15	14.80	16.40	18.05	19.80	21.60	23.30	27.10	31.10	35.25	45.35	50.30	55.10	60.00	65.00	70.05
30	12.70	14.55	16.20	18.00	19.80	21.60	23.50	25.50	29.70	34.20	38.70	49.75	54.95	60.25	65.45	70.70	76 00
32	14.10	16.05	17.90	19.85	22.20	23.85	25.90	28.00	32 65	37.45	42.30	54.50	59.80	65.35	70.90	76.65	81.55
34	15.50	17.60	19.70	21.75	23.85	26.10	28.30	30.50	35.60	40.70	45.90	59.40	64.60	70.50	76.45	82.55	88.20
36	16.95	19.20	21.45	23.70	26.00	28.30	30.70	33.10	38.55	44.00	49.50	64.30	69.45	75.70	82.00	88.45	94.95
38	17.15	21.05	23.45	25.90	28.36	30.80	33.35	35.95	41.65	49.15	53.50	68.75	74.80	81.45	88.25	95.15	102.05
40	19.60	22.90	25.45	28.10	30.70	33.30	36.05	38.75	44.80	52.65	57.50	73.25	80.15	87.30	94.55	101.90	109.10
42	22.05	24.80	27.55	30.30	33.05	35.85	38.75	41.60	47.95	54.40	61.00	77.75	85.45	93.15	100.85	108.60	116.40
44	23.90	26.85	29.75	32.70	35.65	38.65	41.80	44.90	51.60	58 50	65.50	83.45	91.40	99.65	107.85	115.10	124.45
46	25.80	28.90	32.00	35.15	38.35	41.55	44.90	48.20	55.30	62.60	70.00	89.00	97.50	106.15	114.90	123.70	132.50
48	27.70	31.00	34.30	37.65	41.05	44.45	48.00	51.50	59.60	66.70	74.50	94.65	103.60	112.70	121.90	131.25	140.65
50	29.75	33.30	36.80	40.30	43.85	47.45	51.15	54.80	62.70	70.85	79.15	100.50	110.50	119.70	129.50	139.45	149.40
52	31.85	35.65	39.30	43.00	46.75	50.50	54.35	58.15	66.45	75.05	83.80	106.40	116.50	126.85	137.20	147.65	158.20
54	33.95	37.90	41.80	45.70	49.65	53.60	57.55	61.50	70.25	79.25	88.50	112 35	123.05	133.95	144.90	155.95	167.10
56		40.65	44.50	48.50	52.55	56.60	60.75	65.00	74.35	83.55	93.50	119.75	130.05	141.60	153.20	164.70	176.50
58		43.25	47.20	51.30	55.45	59.65	64.00	68.50	78 45	87.85	98.50	125.20	137.15	149.25	161.45	173.55	185.95
60		46.00	50.00	54.10	58.35	62.75	67.30	72.00	82.55	92.15	103.50	131.60	144.25	157.00	169.80	182.60	195.40
62		48.30	52.65	57.10	61.65	66.30	71.10	76.00	86.95	97.25	108.70	138.40	150.60	164.70	178.40	191.85	205.30
64		50.60	55.35	60.10	64.95	69.90	74.90	80.00	91.35	102.35	113.85	145.20	159.05	173.55	187.05	201.15	215.20
66		53.00	58.05	63.15	68.30	73.50	78.75	84.00	95.75	107.55	119.50	152.05	166.50	181.10	195.70	210.40	225.05
68		55.70	60.95	66.25	71.60	77.10	82.55	88.20	100.25	112.55	125.10	159.10	174.25	189.75	204.75	220.05	235.30
70		58.40	63.85	69.25	75.00	80.70	86.40	92.40	104.85	117.65	130.80	166.25	182.00	198.40	213.85	235.70	245.65
72		61.00	66.75	72.55	78.40	84.30	90.30	96.50	109.45	122.75	136.50	173.20	189.75	207.40	222.90	239.45	256.00
74				75.75	81.90	88.50	94.80	101.00	114.45	128.25	142.50	180.65	197.80	215.05	232.10	249.25	266.45
76				79.05	85.50	92.70	99.30	105.50	119.45	133.75	148.45	188.25	205.85	223.70	241.30	259.15	276.90
78				82.35	89.10	95.90	102.85	110.00	124.50	139.25	154.50	195.85	214.00	232.30	250.65	269.05	287.45
80				85.95	92.90	99.85	106.95	114.30	129.50	144.95	160.80	203.65	222.40	241.50	260.20	279.30	298.25
82				89.55	96.70	103.85	111.15	118.65	134.50	150.65	167.10	211.48	230.80	250.70	269.85	289.50	309.10
84		...		93.25	100.50	107.85	115.35	123.00	139.60	156.40	173.50	219.35	239.30	259.30	279.50	299.75	320.05
90						121.00	129.40	138.00	155.60	173.40	191.50	242.30	264.55	286.95	309.30	331.70	354.15
96						134.75	143.85	153.00	172.10	191.75	212.50	267.95	292.70	317.40	341.55	365.70	390.45
102						150.75	160.85	171.00	192.00	213.40	233.50	294.70	320.90	347.30	373.70	400.15	426.60
108						165.35	176.10	187.00	209.50	232.50	256.00	322.25	350.25	378.35	406.35	434.45	462.70
114						182.10	193.50	205.00	228.40	252.45	277.00	348.50	379.40	409.40	439.60	470.00	500.60
120						196.55	208.65	221.00	246.10	271.75	298.00	374.80	406.90	439.90	473.40	505.10	537.75
	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30

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GILBERT WOOD SPLIT PULLEYS.

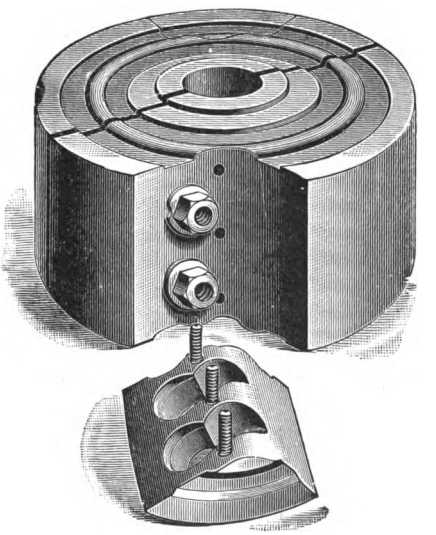
Style B



Are of special construction, and in correctness of balance and trueness of running excel all other wood pulleys. The hard close grained maple wood used in their manufacture provides the face of the pulley with a polished surface that gives perfect contact to the belt and allows the same power to be transmitted with far less tension, thus prolonging the life of the belts and effecting a very considerable saving in power.

Gilbert pulleys are light; the spokes are set so they *cut the air* instead of fanning it. They can be put on or taken off the shaft easily and quickly, will withstand a greater degree of heat or moisture than any other wood pulley, and can be run with perfect safety at from two to three times the speed of iron pulleys.

Style C



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STANDARD LIST, WOOD SPLIT PULLEYS.

Diam. Inches.	WIDTH OF FACE, IN INCHES.									
	2	3	4	5	6	7	8	9	10	11
3	$1 80	$1 90	$2 00	$2 10	$2 25	$2 40	$2 60	$2 85	$3 10	$3 35
4	1 90	2 00	2 10	2 20	2 40	2 60	2 85	3 10	3 35	3 60
5	2 00	2 10	2 20	2 40	2 60	2 85	3 10	3 35	3 60	3 85
6	2 10	2 20	2 35	2 55	2 75	3 00	3 25	3 50	3 75	4 00
7	2 20	2 30	2 45	2 65	2 85	3 10	3 35	3 60	3 85	4 15
8	2 35	2 45	2 60	2 80	3 00	3 25	3 50	3 75	4 00	4 30
9	2 50	2 60	2 80	3 00	3 25	3 50	3 75	4 00	4 30	4 65
10	2 65	2 80	3 00	3 25	3 50	3 75	4 00	4 30	4 65	5 00
11	2 80	3 00	3 25	3 50	3 75	4 00	4 30	4 65	5 00	5 40
12		3 15	3 40	3 65	3 90	4 20	4 55	4 90	5 30	5 70
13		3 30	3 55	3 80	4 10	4 45	4 80	5 20	5 60	6 00
14		3 45	3 70	4 00	4 35	4 70	5 10	5 55	6 00	6 45
15		3 60	3 90	4 25	4 60	5 00	5 45	5 90	6 35	6 80
16		3 80	4 15	4 50	5 00	5 50	6 00	6 50	7 00	7 50
17		4 00	4 40	4 90	5 40	5 90	6 40	6 90	7 40	7 90
18		4 20	4 70	5 20	5 70	6 20	6 70	7 20	7 80	8 40
19		4 40	4 90	5 40	5 90	6 50	7 10	7 70	8 30	8 90
20		4 60	5 20	5 80	6 40	7 00	7 60	8 30	9 00	9 70
21		4 80	5 40	6 00	6 60	7 30	8 00	8 70	9 40	10 20
22		5 00	5 60	6 20	7 00	7 70	8 40	9 20	10 00	10 80
23		5 20	5 80	6 50	7 20	8 00	8 80	9 70	10 60	11 50
24		5 50	6 20	7 00	7 80	8 60	9 40	10 30	11 20	12 10
25		5 90	6 60	7 30	8 10	9 00	10 00	11 00	12 00	13 00
26		6 20	7 00	7 80	8 60	9 50	10 50	11 50	12 60	13 75
27		6 60	7 40	8 20	9 00	10 00	11 10	12 20	13 40	14 60
28		7 00	7 80	8 60	9 50	10 50	11 60	12 80	14 00	15 20
30		7 70	8 60	9 50	10 60	11 80	13 00	14 30	15 60	17 00
32		8 50	9 50	10 50	11 60	12 85	14 10	15 50	17 00	18 60
34		9 40	10 60	11 80	13 10	14 45	15 90	17 40	19 00	20 70
36		10 30	11 70	13 10	14 60	16 10	17 70	19 50	21 00	22 00
38			12 80	14 40	16 00	17 70	19 50	21 20	23 00	24 50
40			13 90	15 70	17 50	19 30	21 25	23 10	25 00	26 50
42			15 00	17 00	19 00	21 00	23 00	25 00	27 00	29 00
44			17 00	19 00	21 00	23 00	25 00	27 00	29 00	31 00
46			19 00	21 00	23 00	25 00	27 00	29 00	31 00	33 00
48			21 00	23 00	25 00	27 00	29 00	31 50	33 90	36 20

Diam. Inches.	WIDTH OF FACE, IN INCHES.							
	12	13	14	16	18	20	22	24
3	$3 60	$3 85	$4 10	$4 75				
4	3 85	4 10	4 40	5 10				
5	4 10	4 40	4 75	5 45				
6	4 30	4 65	5 00	5 70				
7	4 50	4 85	5 20	5 90				
8	4 65	5 00	5 40	6 20				
9	5 00	5 40	5 80	6 60	$7 50	$8 50		
10	5 40	5 80	6 20	7 00	8 00	9 20		
11	5 80	6 20	6 60	7 50	8 60	9 80		
12	6 10	6 50	6 90	7 90	9 10	10 40	$11 80	$13 40
13	6 40	6 80	7 30	8 40	9 60	11 00	12 50	14 10
14	6 90	7 40	7 90	9 10	10 40	11 80	13 40	15 00
15	7 30	7 80	8 40	9 60	11 00	12 60	14 20	16 00
16	8 00	8 50	9 00	10 30	11 80	13 40	15 10	16 90
17	8 40	8 90	9 50	11 00	12 60	14 20	16 00	17 80
18	9 00	9 60	10 30	11 90	13 50	15 20	17 00	19 00
19	9 50	10 20	11 00	12 60	14 30	16 10	17 90	20 10
20	10 40	11 20	12 00	13 80	15 60	17 50	19 60	21 80
21	11 00	11 80	12 70	14 50	16 50	18 60	20 80	23 20
22	11 70	12 60	13 50	15 50	17 70	20 00	22 40	24 80
23	12 50	13 60	14 70	17 00	19 40	21 80	24 30	26 90
24	13 00	14 10	15 20	17 70	20 20	22 80	25 40	28 20
25	14 00	15 20	16 40	19 00	21 80	24 60	27 50	30 50
26	15 00	16 30	17 60	20 40	23 30	26 30	29 50	32 70
27	15 80	17 10	18 50	21 50	24 50	27 70	30 90	34 10
28	16 50	17 90	19 40	22 40	25 60	28 80	32 00	35 30
30	18 50	20 00	21 50	25 00	28 50	32 00	35 50	39 00
32	20 30	22 00	23 80	27 40	31 00	35 00	39 00	43 00
34	22 50	24 20	26 10	29 80	33 60	37 80	42 20	46 80
36	24 00	26 00	28 00	32 00	36 00	40 00	45 00	50 00
38	26 00	28 00	30 00	34 00	38 00	43 00	48 00	54 00
40	28 00	30 00	32 00	36 00	41 00	46 00	51 00	58 00
42	31 00	33 00	35 00	39 00	44 00	49 00	55 00	62 00
44	33 00	35 00	37 00	42 00	47 00	53 00	60 00	67 00
46	36 00	38 00	40 00	45 00	51 00	57 00	65 00	73 00
48	38 50	40 00	43 00	48 00	54 00	61 00	70 00	78 00

We carry in stock pulleys up to 60 inches in diameter for sizes not listed.
For Prices of Special Pulleys and Sizes not Listed, Send for Special Catalogue.

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GILBERT STYLE A—SPECIAL PULLEY



This is especially adapted for main driving pulley, and for other extremely severe work.

It is made entirely of selected, thoroughly seasoned maple, and finished with two coats of shellac varnish.

The rim is both nailed and glued.

The spokes are securely dovetailed into and glued and nailed in the rim; and each one is set in a line running direct from the center of the shaft to the rim—thus affording its utmost support.

It is fitted with a split, iron center, which is turned on the outside, bored to exact size of shaft, and key-seated.

It cannot get out of round.

Every pulley is perfectly balanced.

GILBERT STYLE D—SPECIAL PULLEY

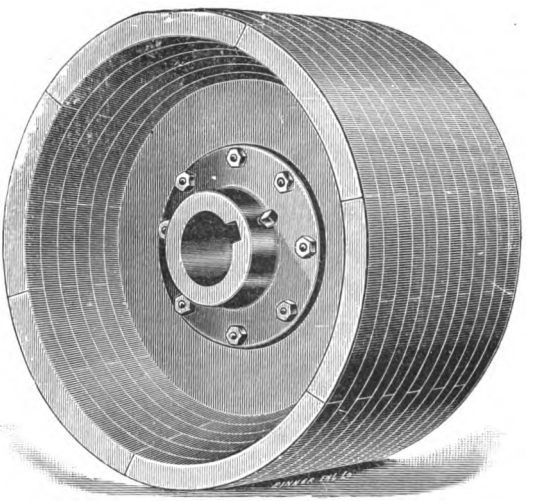
This pulley has a solid web, and is especially adapted for running Dynamos and Trip Hammers, or for other extremely severe work.

It is built of selected, thoroughly seasoned maple, glued and nailed together; and has an iron center fitted with key-seat and set screw.

It is the lightest, strongest, stiffest and best finished Dynamo Pulley manufactured.

Every pulley is perfectly balanced.

Remember that a maple rim will transmit from 40 to 50 per cent more power than an iron rim, with like tension of belt; and that this pulley can be run with perfect safety, at from two to three times the speed which would cause the best iron pulley to fly to pieces.



SPLIT, STYLE D PULLEYS

We can furnish the Style D Pulley, split, if desired. For price, add 20 per cent to regular list, and discount same as whole pulleys.

For prices see following pages.

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PRICE LIST GILBERT STYLE A—SPECIAL PULLEY

Diam. In.	Face. In.	Price.
36	6	$24 30
	7	26 75
	8	29 20
	9	31 70
	10	34 20
	11	36 75
	12	39 30
	13	41 90
	14	44 50
	15	47 15
	16	49 80
	17	52 50
	18	55 20
	19	57 95
	20	60 70
	21	63 50
	22	66 30
	23	69 15
	24	72 00
37	6	25 25
	7	27 85
	8	30 40
	9	33 05
	10	35 65
	11	38 35
	12	41 00
	13	43 75
	14	46 45
	15	49 25
	16	52 00
	17	54 85
	18	57 65
	19	60 55
	20	63 40
	21	66 35
	22	69 25
	23	72 25
	24	75 20
38	6	26 20
	7	28 90
	8	31 60
	9	34 35
	10	37 10
	11	39 90
	12	42 70
	13	45 55
	14	48 40
	15	51 30
	16	54 20
	17	57 15
	18	60 10
	19	63 10
	20	66 10
	21	69 15
	22	72 20
	23	75 30
	24	78 40
39	6	27 20
	7	30 05
	8	32 85
	9	35 75
	10	38 60
	11	41 55
	12	44 45
	13	47 45
	14	50 40
	15	53 45
	16	56 45
	17	59 55
	18	62 60
	19	65 75
39	20	$68 85
	21	72 05
	22	75 20
	23	78 45
	24	81 65
40	6	28 20
	7	31 15
	8	34 10
	9	37 10
	10	40 10
	11	43 15
	12	46 20
	13	49 30
	14	52 40
	15	55 55
	16	58 70
	17	61 90
	18	65 10
	19	68 35
	20	71 60
	21	74 90
	22	78 20
	23	81 55
	24	84 90
41	6	29 25
	7	32 35
	8	35 40
	9	38 55
	10	41 65
	11	44 85
	12	48 00
	13	51 25
	14	54 45
	15	57 75
	16	61 00
	17	64 35
	18	67 65
	19	71 05
	20	74 40
	21	77 85
	22	81 25
	23	84 75
	24	88 20
42	6	30 30
	7	33 50
	8	36 70
	9	39 95
	10	43 20
	11	46 50
	12	49 80
	13	53 15
	14	56 50
	15	59 90
	16	63 30
	17	66 75
	18	70 20
	19	73 70
43	20	77 20
	21	80 75
	22	84 30
	23	87 90
	24	91 50
43	6	31 40
	7	34 75
	8	38 05
	9	41 45
	10	44 80
	11	48 25
	12	51 65
	13	55 15
43	14	$ 58 60
	15	62 15
	16	65 65
	17	69 25
	18	72 80
	19	76 45
	20	80 05
	21	83 75
	22	87 40
	23	91 15
	24	94 85
44	6	32 50
	7	35 95
	8	39 40
	9	42 90
	10	46 40
	11	49 95
	12	53 50
	13	57 10
	14	60 70
	15	64 35
	16	68 00
	17	71 70
	18	75 40
	19	79 15
	20	82 90
	21	86 70
	22	90 50
	23	94 35
	24	98 20
45	6	33 65
	7	37 25
	8	40 80
	9	44 45
	10	48 05
	11	51 75
	12	55 40
	13	59 15
	14	62 85
	15	66 65
	16	70 40
	17	74 25
	18	78 05
	19	81 95
	20	85 80
	21	89 75
	22	93 65
	23	97 65
	24	101 60
46	6	34 80
	7	38 50
	8	42 20
	9	45 95
	10	49 70
	11	53 50
	12	57 30
	13	61 15
	14	65 00
	15	68 90
	16	72 80
	17	76 75
	18	80 70
	19	84 70
	20	88 70
	21	92 75
	22	96 80
	23	100 90
	24	105 00
48	6	37 20
	7	41 15
48	8	$ 45 10
	9	49 10
	10	53 10
	11	57 15
	12	61 20
	13	65 30
	14	69 40
	15	73 55
	16	77 70
	17	81 90
	18	86 10
	19	90 35
	20	94 60
	21	98 90
	22	103 20
	23	107 55
	24	111 90
50	6	39 70
	7	43 90
	8	48 10
	9	52 35
	10	56 60
	11	60 90
	12	65 20
	13	69 55
	14	73 90
	15	78 30
	16	82 70
	17	87 15
	18	91 60
	19	96 10
	20	100 60
	21	105 15
	22	109 70
	23	114 30
	24	118 90
52	6	42 30
	7	46 75
	8	51 20
	9	55 70
	10	60 20
	11	64 75
	12	69 30
	13	73 90
	14	78 50
	15	83 15
	16	87 80
	17	92 50
	18	97 20
	19	101 95
	20	106 70
	21	111 50
	22	116 30
	23	121 15
	24	126 00
54	6	45 00
	7	49 70
	8	54 40
	9	59 15
	10	63 90
	11	68 70
	12	73 50
	13	78 35
	14	83 20
	15	88 10
	16	93 00
	17	97 95
	18	102 90
	19	107 90
	20	112 90
	21	117 95
54	22	$123 00
	23	128 10
	24	133 20
56	6	47 80
	7	52 75
	8	57 70
	9	62 70
	10	67 70
	11	72 75
	12	77 80
	13	82 90
	14	88 00
	15	93 15
	16	98 30
	17	103 50
	18	108 70
	19	113 95
	20	119 20
	21	124 50
	22	129 80
	23	135 15
	24	140 50
58	6	50 70
	7	55 90
	8	61 10
	9	66 35
	10	71 60
	11	76 90
	12	82 20
	13	87 55
	14	92 90
	15	98 30
	16	103 70
	17	109 15
	18	114 60
	19	120 10
	20	125 60
	21	131 15
	22	136 70
	23	142 30
	24	147 90
60	6	53 70
	7	59 15
	8	64 60
	9	70 10
	10	75 60
	11	81 15
	12	86 70
	13	92 30
	14	97 90
	15	103 55
	16	109 20
	17	114 90
	18	120 60
	19	126 35
	20	132 10
	21	137 90
	22	143 70
	23	149 55
	24	155 40
62	6	56 80
	7	62 50
	8	68 20
	9	73 95
	10	79 70
	11	85 50
	12	91 30
	13	97 15
	14	103 00
	15	108 90
62	16	$114 80
	17	120 75
	18	126 70
	19	132 70
	20	138 70
	21	144 75
	22	150 80
	23	156 90
	24	163 00
64	13	102 10
	14	108 20
	15	114 35
	16	120 50
	17	126 70
	18	132 90
	19	139 15
	20	145 40
	21	151 70
	22	158 00
	23	164 35
	24	170 70
66	6	63 30
	7	69 50
	8	75 70
	9	81 95
	10	88 20
	12	100 80
	14	113 50
	16	126 30
	18	139 20
	20	152 20
	22	165 30
	24	178 50
68	6	66 70
	7	73 15
	8	79 60
	9	86 10
	10	92 60
	12	105 70
	14	118 90
	16	132 20
	18	145 60
	20	159 10
	22	172 70
	24	186 40
70	6	70 20
	7	76 90
	8	83 60
	9	90 35
	10	97 10
	12	110 70
	14	124 40
	16	138 20
	18	152 10
	20	166 10
	22	180 20
	24	194 40
72	6	73 80
	7	80 75
	8	87 70
	9	94 70
	10	101 70
	12	115 80
	14	130 00
	16	144 30
	18	158 70
	20	173 20
	22	187 80
	24	202 50

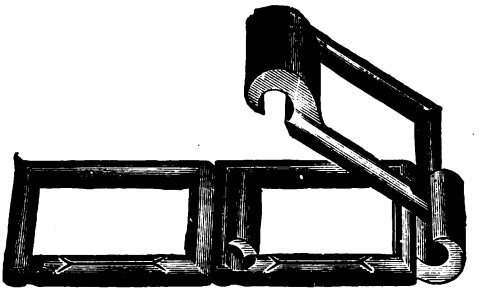
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PRICE LIST GILBERT STYLE D—SPECIAL PULLEY

Diam. In.	Face, In.	Price.
6	4	$ 6 80
	5	7 30
	6	7 80
	7	8 30
	8	8 80
	9	9 30
	10	9 80
	11	10 30
	12	10 80
7	4	6 95
	5	7 48
	6	8 00
	7	8 53
	8	9 05
	9	9 58
	10	10 10
	11	10 63
	12	11 15
8	4	7 10
	5	7 65
	6	8 20
	7	8 75
	8	9 30
	9	9 85
	10	10 40
	11	10 95
	12	11 50
9	4	7 30
	5	7 88
	6	8 45
	7	9 03
	8	9 60
	9	10 18
	10	10 75
	11	11 33
	12	11 90
	13	12 48
	14	13 05
10	4	7 50
	5	8 10
	6	8 70
	7	9 30
	8	9 90
	9	10 50
	10	11 10
	11	11 70
	12	12 30
	13	12 90
	14	13 50
11	4	7 70
	5	8 33
	6	8 95
	7	9 58
	8	10 20
	9	10 83
	10	11 45
	11	12 08
	12	12 70
	13	13 33
	14	13 95
12	4	8 00
	5	8 65
	6	9 30
	7	9 95
	8	10 60
	9	11 25
	10	11 90
	11	12 55
	12	13 20
	13	13 85
	14	14 50
13	4	$ 8 30
	5	8 98
	6	9 65
	7	10 33
	8	11 00
	9	11 68
	10	12 35
	11	13 03
	12	13 70
	13	14 38
	14	15 05
14	4	8 60
	5	9 30
	6	10 00
	7	10 70
	8	11 40
	9	12 10
	10	12 80
	11	13 50
	12	14 20
	13	14 90
	14	15 60
15	4	8 95
	5	9 68
	6	10 40
	7	11 13
	8	11 85
	9	12 58
	10	13 30
	11	14 02
	12	14 75
	13	15 48
	14	16 20
16	4	9 30
	5	10 05
	6	10 80
	7	11 55
	8	12 30
	9	13 05
	10	13 80
	11	14 55
	12	15 30
	13	16 05
	14	16 80
	15	17 55
17	4	9 70
	5	10 48
	6	11 25
	7	12 03
	8	12 80
	9	13 58
	10	14 35
	11	15 13
	12	15 90
	13	16 68
	14	17 45
	15	18 23
18	4	10 10
	5	10 90
	6	11 70
	7	12 50
	8	13 30
	9	14 10
	10	14 90
	11	15 70
	12	16 50
	13	17 30
	14	18 10
	15	18 90
	16	19 70
19	4	$10 55
	5	11 38
	6	12 20
	7	13 03
	8	13 85
	9	14 68
	10	15 50
	11	16 33
	12	17 15
	13	17 98
	14	18 80
	15	19 63
	16	20 45
20	4	11 00
	5	11 85
	6	12 70
	7	13 55
	8	14 40
	9	15 25
	10	16 10
	11	16 95
	12	17 80
	13	18 65
	14	19 50
	15	20 35
	16	21 20
21	4	11 50
	5	12 38
	6	13 25
	7	14 13
	8	15 00
	9	15 88
	10	16 75
	11	17 63
	12	18 50
	13	19 33
	14	20 25
	15	21 13
	16	22 00
22	4	12 00
	5	12 90
	6	13 80
	7	14 70
	8	15 60
	9	16 50
	10	17 40
	11	18 30
	12	19 20
	13	20 10
	14	21 00
	15	21 90
	16	22 80
23	4	12 55
	5	13 48
	6	14 40
	7	15 37
	8	16 25
	9	17 18
	10	18 10
	11	19 03
	12	19 95
	13	20 88
	14	21 80
	15	22 73
	16	23 65
24	4	13 20
	5	14 10
	6	15 00
	7	15 95
	8	16 90
	9	17 90
	10	18 90
	11	19 95
	12	21 00
	13	22 10
24	14	$23 20
	15	24 35
	16	25 50
	17	26 70
	18	27 90
	19	29 15
	20	30 40
	21	31 70
	22	33 00
	23	34 35
	24	35 70
25	4	13 60
	5	14 63
	6	15 65
	7	16 73
	8	17 80
	9	18 93
	10	20 05
	11	21 23
	12	22 40
	13	23 63
	14	24 85
	15	26 13
	16	27 40
	17	28 73
	18	30 05
	19	31 43
	20	32 80
	21	34 23
	22	35 65
	23	37 13
	24	38 60
26	4	14 00
	5	15 15
	6	16 30
	7	17 50
	8	18 70
	9	19 95
	10	21 20
	11	22 50
	12	23 80
	13	25 15
	14	26 50
	15	27 90
	16	29 30
	17	30 75
	18	32 20
	19	33 70
	20	35 20
	21	36 75
	22	38 30
	23	39 90
	24	41 50
27	4	14 45
	5	15 73
	6	17 00
	7	18 33
	8	19 65
	9	21 03
	10	22 40
	11	23 83
	12	25 25
	13	26 73
	14	28 20
	15	29 73
	16	31 25
	17	32 83
	18	34 40
	19	36 03
	20	37 65
	21	39 33
	22	41 00
	23	42 73
	24	44 45
28	4	$14 90
	5	16 30
	6	17 70
	7	19 15
	8	20 60
	9	22 10
	10	23 60
	11	25 15
	12	26 70
	13	28 30
	14	29 90
	15	38 55
	16	33 20
	17	34 90
	18	36 60
	19	38 35
	20	40 10
	21	41 90
	22	43 70
	23	45 55
	24	47 40
29	4	15 40
	5	16 93
	6	18 45
	7	20 03
	8	21 60
	9	23 23
	10	24 85
	11	26 53
	12	28 20
	13	29 93
	14	31 65
	15	33 43
	16	35 20
	17	37 03
	18	38 85
	19	40 73
	20	42 60
	21	44 53
	22	46 45
	23	48 43
	24	50 40
30	4	15 90
	5	17 55
	6	19 20
	7	20 90
	8	22 60
	9	24 35
	10	26 10
	11	27 90
	12	29 70
	13	31 55
	14	33 40
	15	35 30
	16	37 20
	17	39 15
	18	41 10
	19	43 10
	20	45 10
	21	47 15
	22	49 20
	23	51 30
	24	53 40
31	4	16 45
	5	18 23
	6	20 00
	7	21 83
	8	23 65
	9	25 53
	10	27 40
	11	29 33
	12	31 25
	13	33 23
	14	35 20
32	15	$37 23
	16	39 25
	17	41 33
	18	43 40
	19	45 53
	20	47 65
	21	49 83
	22	52 00
	23	54 23
	24	56 45
32	4	17 00
	5	18 90
	6	20 80
	7	22 75
	8	24 70
	9	26 70
	10	28 70
	11	30 75
	12	32 80
	13	34 90
	14	37 00
	15	39 15
	16	41 30
	17	43 50
	18	45 70
	19	47 95
	20	50 20
	21	52 50
	22	54 80
	23	57 15
	24	59 50
33	4	17 60
	5	19 63
	6	21 65
	7	23 73
	8	25 80
	9	27 93
	10	30 05
	11	32 23
	12	34 40
	13	36 63
	14	38 85
	15	41 13
	16	43 40
	17	45 73
	18	48 05
	19	50 43
	20	52 80
	21	55 23
	22	57 65
	23	60 13
	24	62 60
34	4	18 20
	5	20 35
	6	22 50
	7	24 70
	8	26 90
	9	29 15
	10	31 40
	11	33 70
	12	36 00
	13	38 35
	14	40 70
	15	43 10
	16	45 50
	17	47 95
	18	50 40
	19	52 90
	20	55 40
	21	57 95
	22	60 50
	23	63 10
	24	65 70

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DETACHABLE LINK BELTING



All of our Link Belting is made of the very best refined Malleable Iron. The Links are drop hammered and accurately pitched to length, and subjected to severe stationary and operative tests, and proved to far higher speed than should ever be required in practical operation and finally are tested to fully double the working strain given in the list, to insure as perfect goods as it is possible to produce. It is not best to over-strain Link Belting in working, nor run it too fast.

REVISED PRICE LIST

Price Chain				Price Usual Attachment Links, per Foot									
No. of Chain	Price per foot	Price Pair Couplers	Links per foot	A1	C1	F2	H1	H2	K1	K2	K3	R1	S1
25	$0.11	$0.11	13.3	$0.21	$0.29			$0.28	$0.26				$0.27
32	.11	.14	10.4	.24	.32				.30		$0.39		
33	.11	.13	8.6	.17	.26				.25		.39		.25
34	.11	.13	8.6	.21	.33				.29				
35	.11	.16	7.4	.23	.32				.32				.25
42	.12	.16	8.8	.21	.29				.26		.37		.25
45	.11	.16	7.4	.20	.27	$0.27	$0.32	.35	.26		.34		.23
51	.17	.16	10.4	.24									.28
52	.18	.16	8.	.28	.33	.43			.35				.32
55	.16	.16	7.4	.25	.31	.35			.28				.25
57	.18	.19	5.2	.30	.30	.43	.41	.44	.35				
62	.22	.22	7.3	.32	.39				.35				.32
66	.23	.22	6.		.40				.42				
67	.23	.22	5.2	.32		.48	.50		.40				
75	.24	.19	4.6			.52	.45	.45	.39			$.29	
77	.25	.22	5.2	.37		.64	.48		.42		.54	.32	
78	.34	.25	4.6	.46		.70	.66	.70	.47		.66	.42	
83	.35	.32	3.			.92			.63				
85	.44	.44	3.			.92	.72	.78			.85		.89
88	.43	.28	4.6	.70	.77	.80	.76	.78	.61			.51	
95	.53	.54	3.			1.10	.86	.96		$.84			
103	.67	.58	4.	.91		1.11	.95	1.02	.95			.82	
105	.49		2.							.97		.87	
108	.63	.79	2.55			1.18		.95		1.08			
114	.85	.84	3.6			1.35			1.21				
122	1.13	1.58	2.			1.58				1.66			
124	1.03	1.19	3.			1.54			1.56			1.21	
146	1.02		2.			1.49				1.76			

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REGULAR LIST OF ATTACHMENTS

The prices of attachments are for A1, A2, A3, C1, E1, F2, G1, G6, H1, H2, K1, K2, M1, M3, S1, and S2, and as they are now made for the respective chains. Other attachments will be furnished at special prices.

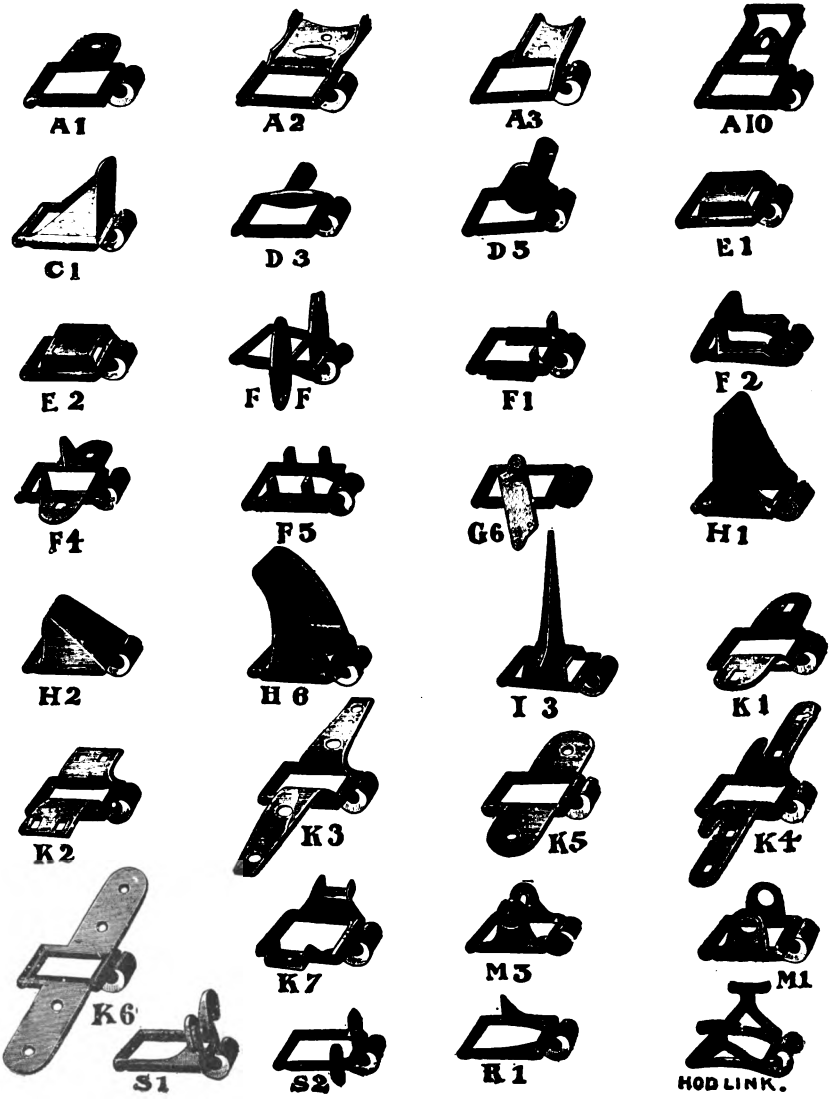
No. 025	No. 25	No. 32	No. 33	No. 34	No. 35	No. 37	No. 38	No. 39	No. 042	No. 42	No. 43	No. 44	No. 45	No. 45½	No. 47	No. 48	No. 50	No. 51	No. 052	No. 52	No. 52½	No. 53	No. 55	No. 057	No. 57	No. 59	No. 62	No. 65	No. 66	No. 67	No. 75	No. 77	No. 78	No. 83	No. 85	No. 88	
A3	A3	A1	A1	A1	A1	K5	A3	L3	A1	A1	K3	A3	A1	C1	L2	A3	A1	A1	cplr	A1	Cplr	C1	A1	G 26	A1	A23	A1	B1	C1	A1	C4	A1	A1	D5	A4	A3	
K1	A9	A2	A3	C1	A2	L3	C1		L2	A1	Cplr	K1	A3	C 12	L3	A4	A3	K3½	C14		A3		E1	A2	L3	C4		A1	B2	E4	A7	E1	E1	A3	E1	A7	A28
	C¼	A3	A6	C2	A10	S1	D1			cplr	K5	A10	L4		B1	D4			A17		S1	A3	L4	C4		cplr	A11	I¹	A11	F2	H1	E1	F2	E1	F1		
	C½	A12	A13	C6	A13		D6			Ald	K6	A12			B2	I¹⁶			C1			A20		D5		A3		R18	D5	H2	G1	A11	G1	G6	F2		
	C1	A13	A14	C15	A14		E1			A3	Cplr	A13			D1	I¹⁶			C4			A41		E1		A4		cplr	E1	H3	G5	A16	M3	F5			
	C4	A18	C1	C16	A20		EPin			A6		A14			I²	K1			D3			Cl		E7		A5		E2	F2	H4	G6	D5	M4	G6			
	C5	A19	D3	C21	C1					A15		A20			K1	K5			D4			C5		F2		A12		F9	G1	H4	H1	E1	cplr	H1			
	C11	C1	D33	E1	D7					C1		A26				K7			D5			C8		F9		C1		G11	H1	K1	H9	F2		K2			
	C14	C5	E1	K1	D9					D3		A27				S1			D12			D3		G11		C5		H1	R1	R1	K1	F4		K4			
	D3	C 10	EM 1	K6	E1					E1		A	No. 45						E1			D6		H1		D5		H2	K C	R2	K8	G1		K7			
	D15	D3	EM 2	cplr	K1					I11		Strp	con						F2			E1		K1		E4		K1	L5	R8	L2	G6		M3			
	E1	E1	I1		K5					I13		C1	K C						G1			F2		K1		E5		cplr	R7	cplr	R1	H1		R1			
	EStd	EK	I3		L1					K1		C6	L2						K1			G2		cplr		G11		L9	S2	Scpr	R3	H2		R8			
	E5	G1	K1		S1					K3		C9	L3						K5			G27		L9		J1		S2			S2	H6		R20			
	G1	I3	K3		cplr					K3½		C 15	M1						R10			K1		S2		K1					cplr	K1		S2			
	H2	I4	K5							K5		C 20	M4						R20			K10		Cplr		K5						K3					
	I3	K1	K6							K6		C 22	M7						S1	Swivel		K13				K18			No. 71			M3					
	IK	K3	K11							L6		C 28	M8						Cplr			K17	No. 55			Cplr						R1					
	K1	K5	K12							M 2		D1	M9							Socket		K C	con									R8					
	K5	K6	K13							M 5		D3	P4									L2	S1									R20					
	K6	L1	L2							S1		D5	P4½									M1	S5									S2					
	L2	L2	M1							S3		D6	S1									M5	Cplr														
	M1	M1	S1							cplr		D10	S4																								
	M5	S9	cplr							Rake Tooth		E1	S5			No. 93	No. 94	No. 95	No. 101	No. 103	No. 103	No. 165	No. 106	No. 108	No. 114	No. 122	No. 124	No. 146	No. 160	No. 71½							
	R4	U1								Rake Head		E4	S6																								
	R6	cplr										E12	Scpr			G1	F1	F2	G6	A1	F8	F1	K2	F2	A11	F2	A4	E2	F2	cplr							
	R9											F2	No. 1				K1	H1		A4	G6	H2		F3	D D	K2	A11	F2									
	R10											G1	Scpr				K2	K2		A5	G10	H4		G1	F8	Cplr	D5	F5									
	R11											G2	No. 2				cplr	cplr		A11	H1	K2		G6	K1		F2	K2									
	R12											H2	Scpr							A22	H2	K4		K2	cplr		F8	K4									
	R14											I3	No. 3							A24	H3	M3		K3			G1										
	R15											I12	Scpr							D5	K1			cplr			G6										
	R16											I16	No. 3							D D	K8			Hod			K1										
	R26											K1	Cplr							E1	K19	No. 103		No. 110			M3	No 130		No. 072							
	S1											K3	Tube							E5	M1			K2			cplr	cplr		K1							
	S9											K5	40							F2	M3	cplr		cplr													
	U											K10	Spec							F3	R1																
	cplr																																				
	cup																																				

Please take notice that attachments are only made as shown in this table for the different sizes.

Some attachments are made only to order at extra cost and are not kept in stock.

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ATTACHMENTS, AS USUALLY MADE



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SPROCKET WHEELS

BORED AND KEY-SEATED OR SET-SCREWED

LIST MAY 1ST, 1907

In ordering, give Number and Style of Chain. Also give diameter and teeth of Wheels, size of bore, and whether with Key-Seat or Set-Screws. There is a small extra charge where *both* Set-Screws and Key-Seat are ordered.

No. 25
Bore, $1\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$1\frac{1}{2}$	5	$1 10
$1\frac{3}{4}$	6	1 15
2	7	1 15
$2\frac{1}{2}$	8	1 20
$2\frac{3}{4}$	9	1 20
3	10	1 25
$3\frac{1}{4}$	11	1 30
$3\frac{1}{2}$	12	1 35
$3\frac{3}{4}$	13	1 40
4	14	1 45
$4\frac{1}{4}$	15	1 50
$4\frac{3}{4}$	16	1 50
5	17	1 55
$5\frac{1}{4}$	18	1 55
$5\frac{1}{2}$	19	1 60
$5\frac{3}{4}$	20	1 65
6	21	1 70
$6\frac{1}{4}$	22	1 70
$6\frac{3}{4}$	23	1 75
7	24	1 75
$7\frac{1}{4}$	25	1 80
$7\frac{1}{2}$	26	1 80
$7\frac{3}{4}$	27	1 80
8	28	1 85
$8\frac{1}{4}$	30	1 90
9	32	1 95
$9\frac{1}{4}$	33	2 00
$9\frac{3}{4}$	34	2 05
10	35	2 10
$10\frac{1}{4}$	36	2 15
$10\frac{3}{4}$	37	2 15
$11\frac{1}{2}$	40	2 30
12	42	2 40
$12\frac{1}{4}$	43	2 45
$12\frac{3}{4}$	44	2 55
13	45	2 55
$13\frac{3}{4}$	48	2 60
$14\frac{1}{2}$	50	2 70
15	52	2 80
$15\frac{1}{2}$	54	2 90
16	56	3 00
$17\frac{1}{4}$	60	3 25
$18\frac{1}{4}$	64	3 50
20	70	3 80
24	84	5 00

No. 32
Bore, $1\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
2	5	$1 15
$2\frac{1}{4}$	6	1 20
$2\frac{3}{4}$	7	1 25
3	8	1 30
$3\frac{1}{2}$	9	1 35
$3\frac{3}{4}$	10	1 40
$4\frac{1}{4}$	11	1 45
$4\frac{1}{2}$	12	1 55
$4\frac{3}{4}$	13	1 65
$5\frac{1}{4}$	14	1 70
$5\frac{3}{4}$	15	1 80
6	16	1 85
$7\frac{1}{2}$	20	2 05
$8\frac{1}{4}$	22	2 15
$8\frac{1}{2}$	23	2 20
9	24	2 25
$9\frac{1}{4}$	25	2 30
$9\frac{1}{2}$	26	2 35
10	27	2 40
$10\frac{1}{4}$	28	2 45
$11\frac{3}{4}$	32	2 70
12	33	2 80
$12\frac{1}{2}$	34	2 85
$13\frac{1}{4}$	36	2 90
14	38	3 00
$14\frac{3}{4}$	40	3 10
15	41	3 20
16	44	3 35
$16\frac{1}{2}$	45	3 40

Nos. 33, 34
Bore, $1\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$2\frac{3}{4}$	6	$1 30
3	7	1 35
$3\frac{1}{2}$	8	1 40
4	9	1 45
$4\frac{1}{2}$	10	1 50
5	11	1 60
$5\frac{1}{2}$	12	1 70
$6\frac{1}{4}$	14	1 80
$6\frac{1}{2}$	15	1 90
7	16	2 00
8	18	2 10
$8\frac{1}{2}$	19	2 20
9	20	$2 30
$9\frac{3}{4}$	22	2 40
$10\frac{3}{4}$	24	2 50
11	25	2 60
12	27	2 70
$12\frac{1}{2}$	28	2 75
13	29	2 80
$13\frac{1}{2}$	30	2 90
$14\frac{1}{4}$	32	3 00
$15\frac{1}{4}$	34	3 20
16	36	3 30
$18\frac{1}{4}$	41	3 65
$18\frac{3}{4}$	42	3 70
24	54	4 90
$28\frac{1}{2}$	64	5 90

Nos. 35, 45, 55
Bore, $1\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$2\frac{1}{2}$	5	$1 50
3	6	1 60
$3\frac{3}{4}$	7	1 70
$4\frac{1}{4}$	8	1 80
$4\frac{3}{4}$	9	1 90
$5\frac{1}{4}$	10	2 00
$5\frac{3}{4}$	11	2 10
6	12	2 20
7	13	2 30
$7\frac{1}{4}$	14	2 40
$7\frac{3}{4}$	15	2 50
$8\frac{1}{2}$	16	2 60
$8\frac{3}{4}$	17	2 70
$9\frac{1}{2}$	18	2 80
10	19	2 90
$10\frac{1}{2}$	20	3 00
11	21	3 10
$11\frac{1}{2}$	22	3 20
12	23	3 30
$12\frac{1}{2}$	24	3 40
13	25	3 50
$14\frac{1}{4}$	27	3 70
$14\frac{1}{2}$	28	3 80
15	29	3 90
$15\frac{1}{2}$	30	4 00
16	31	4 10
$16\frac{1}{2}$	32	4 20

Nos. 35, 45, 55
Bore, $1\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$17\frac{1}{4}$	33	$4 30
$18\frac{1}{4}$	35	4 60
$18\frac{1}{2}$	36	4 70
$20\frac{1}{4}$	39	5 10
$20\frac{3}{4}$	40	5 20
$21\frac{3}{4}$	42	5 40
$22\frac{1}{4}$	44	5 80
$23\frac{1}{2}$	45	6 00
$23\frac{3}{4}$	46	6 20
$24\frac{3}{4}$	48	6 50
$25\frac{1}{4}$	49	6 60
$25\frac{3}{4}$	50	6 80
28	54	7 50
30	58	8 30
$31\frac{1}{4}$	60	8 70
36	69	11 00
42	82	14 00

No. 42
Bore, $1\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
2	5	$1 50
$2\frac{3}{4}$	6	1 60
3	7	1 70
$3\frac{3}{4}$	8	1 80
$4\frac{1}{4}$	9	1 90
$4\frac{3}{4}$	11	1 95
$5\frac{1}{4}$	12	2 00
$5\frac{3}{4}$	13	2 05
$6\frac{1}{4}$	14	2 10
7	16	2 20
$7\frac{1}{2}$	17	2 25
8	18	2 30
$8\frac{1}{4}$	19	2 35
$8\frac{3}{4}$	20	2 40
$9\frac{1}{4}$	21	2 45
$9\frac{1}{2}$	22	2 50
$10\frac{1}{2}$	24	2 60
$11\frac{1}{2}$	26	2 75
$11\frac{3}{4}$	27	2 80
$12\frac{1}{4}$	28	2 90
14	32	3 20
$15\frac{1}{2}$	36	3 60
18	41	4 00
20	46	4 50
24	55	5 50

NOTE—These prices cover wheels with bores as specified above. For wheels having hubs and bores larger than Standard, or otherwise special, additional charge will be made.

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SPROCKET WHEELS—CONTINUED.

No. 51
Bore, $1\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$1\frac{3}{4}$	5	$1 40
$2\frac{1}{4}$	6	1 45
$2\frac{1}{2}$	7	1 50
3	8	1 55
$3\frac{1}{4}$	9	1 60
4	11	1 70
$4\frac{1}{2}$	12	1 75
5	14	1 85
6	16	1 95
$6\frac{1}{4}$	17	2 00
8	22	2 25
10	27	2 50
12	33	2 90
$13\frac{1}{4}$	36	3 05
14	39	3 20
$15\frac{1}{2}$	42	3 40
$16\frac{1}{2}$	45	3 70
$18\frac{1}{4}$	50	4 10

No. 52
Bore, $1\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$2\frac{3}{4}$	6	$1 50
$3\frac{1}{2}$	7	1 60
4	8	1 70
$4\frac{1}{4}$	9	1 80
5	10	1 90
$5\frac{1}{4}$	11	2 00
$5\frac{1}{2}$	12	2 10
6	13	2 20
$6\frac{1}{2}$	14	2 30
7	15	2 40
$7\frac{1}{2}$	16	2 50
8	17	2 60
$8\frac{1}{4}$	18	2 70
9	19	2 75
$9\frac{1}{2}$	20	2 80
10	21	2 90
$10\frac{3}{4}$	22	3 00
11	23	3 10
$11\frac{1}{2}$	24	3 15
12	25	3 20
$12\frac{1}{2}$	26	3 30
13	27	3 40
$14\frac{1}{4}$	30	3 60
$14\frac{3}{4}$	31	3 70
$15\frac{1}{4}$	32	3 80
$15\frac{3}{4}$	33	3 90
$16\frac{1}{2}$	34	4 00

No. 52
Bore, $1\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$16\frac{3}{4}$	35	4 10
$17\frac{1}{4}$	36	4 15
$17\frac{3}{4}$	37	4 20
18	38	4 30
$19\frac{1}{4}$	40	4 60
20	42	4 80
21	44	5 00
22	46	5 20
$23\frac{3}{4}$	49	5 60
$24\frac{1}{2}$	51	5 80
25	52	6 00
$26\frac{1}{2}$	55	6 40
$30\frac{1}{2}$	64	8 00
36	75	12 50

Nos. 57, 67, 77
Bore, $2\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$4\frac{1}{2}$	5	$1 80
$4\frac{3}{4}$	6	1 90
$5\frac{1}{2}$	7	2 20
6	8	2 40
$6\frac{3}{4}$	9	2 60
$7\frac{1}{2}$	10	2 80
8	11	2 90
$8\frac{3}{4}$	12	3 10
$9\frac{1}{2}$	13	3 25
$10\frac{1}{4}$	14	3 40
11	15	3 55
$11\frac{3}{4}$	16	3 70
$12\frac{1}{2}$	17	3 85
$13\frac{1}{4}$	18	4 00
14	19	4 20
$14\frac{3}{4}$	20	4 40
$15\frac{1}{2}$	21	4 60
$16\frac{1}{2}$	22	4 80
17	23	5 00
$17\frac{1}{2}$	24	5 20
$18\frac{1}{4}$	25	5 40
19	26	5 60
$19\frac{3}{4}$	27	5 85
20	28	6 10
22	30	6 50
$23\frac{1}{2}$	32	7 00
$24\frac{1}{4}$	33	7 25
25	34	7 50
$25\frac{1}{2}$	35	7 75
26	36	8 00
28	38	8 60

Nos. 57, 67, 77
Bore, $2\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$29\frac{1}{4}$	40	9 20
30	41	9 50
$31\frac{1}{2}$	43	10 10
$32\frac{1}{2}$	44	10 40
$35\frac{1}{4}$	48	11 80
36	49	12 20
$38\frac{1}{2}$	52	13 20
$39\frac{1}{4}$	54	13 90
$41\frac{1}{2}$	56	14 60
43	59	15 80
$44\frac{1}{2}$	60	16 50
$47\frac{1}{2}$	64	18 50
54	74	30 00

No. 62
Bore, $2\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$3\frac{3}{4}$	7	$1 85
$4\frac{1}{4}$	8	1 95
5	9	2 05
$5\frac{1}{4}$	10	2 15
$5\frac{3}{4}$	11	2 25
$6\frac{1}{4}$	12	2 40
$6\frac{3}{4}$	13	2 55
$7\frac{1}{4}$	14	2 70
8	15	2 80
$8\frac{1}{4}$	16	3 00
$9\frac{1}{4}$	18	3 20
10	19	3 35
$10\frac{1}{2}$	20	3 50
11	21	3 60
$11\frac{1}{2}$	22	3 80
12	23	4 00
$12\frac{3}{4}$	24	4 15
$13\frac{3}{4}$	26	4 45
$14\frac{3}{4}$	28	4 70
16	30	5 10
18	34	5 60
20	38	6 20
21	39	6 35
$21\frac{1}{2}$	41	6 60
$22\frac{1}{4}$	42	6 80
23	43	7 00
24	45	7 40
$25\frac{1}{4}$	48	8 10
26	49	8 30
$30\frac{1}{2}$	58	10 20
....		
....		

No. 66
Bore, $2\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
5	8	$1 90
$5\frac{3}{4}$	9	2 00
7	11	2 20
$7\frac{1}{2}$	12	2 30
$8\frac{1}{2}$	13	2 50
9	14	2 60
$10\frac{1}{4}$	16	2 80
$11\frac{1}{2}$	18	3 00
$12\frac{1}{2}$	19	3 20
$16\frac{1}{4}$	25	4 00

Nos. 75, 78, 88
Bore, $2\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
$4\frac{1}{4}$	5	$2 40
5	6	2 60
6	7	2 80
$6\frac{1}{2}$	8	3 00
$7\frac{1}{2}$	9	3 20
$8\frac{1}{4}$	10	3 45
9	11	3 70
10	12	3 95
$10\frac{3}{4}$	13	4 20
$11\frac{1}{2}$	14	4 50
$12\frac{1}{2}$	15	4 80
$13\frac{1}{4}$	16	5 10
$14\frac{1}{4}$	17	5 50
15	18	5 80
16	19	6 20
$16\frac{1}{2}$	20	6 60
$17\frac{1}{2}$	21	6 95
$18\frac{1}{2}$	22	7 30
$19\frac{1}{4}$	23	7 60
20	24	8 00
21	25	8 30
$21\frac{3}{4}$	26	8 60
$22\frac{1}{2}$	27	8 90
$23\frac{1}{4}$	28	9 20
24	29	9 50
$24\frac{3}{4}$	30	9 80
$26\frac{3}{4}$	32	10 10
$27\frac{1}{2}$	33	10 70
$28\frac{1}{2}$	34	11 10
$29\frac{1}{2}$	35	11 50
30	36	11 90
$30\frac{1}{2}$	37	12 40
$32\frac{1}{2}$	39	13 40
$33\frac{1}{2}$	40	13 90
35	42	14 90

NOTE—These prices cover wheels with bores as specified above.
For wheels having hubs and bores larger than standard, or otherwise special, additional charge will be made.

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SPROCKET WHEELS—CONTINUED

Nos. 75, 78, 88
Bore, $2\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
37	44	15 90
38	46	17 10
39¾	48	18 30
41	49	19 00
41¾	50	19 70
45	54	22 50
48	58	24 80
50	60	26 00
54	65	27 00
64	77	33 50
....		
....		
....		
....		
....		

Nos. 83, 93
Bore, $2\frac{15}{16}$ in. and less

Pitch Diam. Ins.		No. of Teeth	Price
12	Double Teeth	18	$4 80
14¼		22	5 50
15½		24	6 30
16		26	6 90
17¾		28	7 40
20		32	8 30
24		38	10 20

Nos. 83, 93
Bore, $2\frac{15}{16}$ in. and less

Pitch Diam. Ins.		No. of Teeth	Price
25½	Double Teeth	40	$10 90
28½		44	12 50
30		48	14 20
34		54	16 50
41		64	21 50
50		80	30 30
54		84	35 20
....			
....			
....			

Nos. 85, 95
Bore, $2\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
7¾	6	$4 00
10	8	5 00
11¾	9	5 50
12½	10	6 05
13½	11	6 50
15	12	6 95
16	13	7 40
17½	14	7 85
19	15	8 00
20	16	8 80
22½	18	10 25
24	19	11 00
25¼	20	11 90

Nos. 85, 95
Bore, $2\frac{15}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
27¾	22	$13 60
30	24	15 40
31½	25	16 25
33	26	17 15
34	27	18 25
35½	28	20 40
41	32	24 50
48¼	38	30 00
60	47	45 00

No. 103
Bore, $3\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
6	6	$3 60
7	7	4 00
7¾	8	4 40
8¾	9	4 80
9¾	10	5 25
10¾	11	5 65
11¾	12	6 05
12½	13	6 45
13½	14	6 85
14½	15	7 25
15½	16	7 65
16½	17	8 05
17½	18	8 45
18	19	8 90

No. 103
Bore, $3\frac{7}{16}$ in. and less

Pitch Diam. Ins.	No. of Teeth	Price
19½	20	$9 40
21½	22	10 35
22½	23	10 80
23½	24	11 20
25½	26	12 25
26½	27	12 75
27½	28	13 30
29¼	30	14 40
30	31	15 20
31½	32	16 00
32	33	16 80
33¼	34	17 60
34	35	18 20
35¼	36	19 25
37	38	21 20
39¼	40	23 10
41	42	24 80
43¼	44	26 50
45	46	28 20
47	48	29 90
48	49	30 75
53	54	34 90
53¾	55	35 50
58¾	60	40 00
60	61	42 00
64¾	66	45 50
71½	73	60 00
79	81	70 00

NOTE—These prices cover wheels with bores as specified above.
For wheels having hubs and bores larger than standard, or otherwise special, additional charge will be made.

ADDITIONAL PRICE TO BE ADDED TO THE LIST PRICE FOR SPLIT SPROCKET WHEELS

No. of Chain	Number of Teeth															
	4-7	8-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80
25		$1 15	$1 15	$1 20	$1 20	$1 25	$1 25	$1 30	$1 35	$1 40	$1 45	$1 50	$1 55	$1 60	$1 70	$1 75
32		1 20	1 25	1 30	1 40	1 45	1 50	1 55	1 65	1 70	1 80	1 90	2 00	2 05	2 15	2 25
33-34-42		1 30	1 35	1 40	1 50	1 55	1 65	1 75	1 85	1 95	2 05	2 20	2 35	2 50	2 65	2 80
35-45-55		1 40	1 50	1 60	1 75	1 90	2 00	2 15	2 35	2 60	2 85	3 10	3 35	3 60	3 85	4 15
51		1 20	1 25	1 30	1 40	1 45	1 50	1 55	1 65	1 75	1 90	2 00	2 10	2 25	2 40	2 50
52		1 40	1 50	1 60	1 70	1 80	1 90	2 00	2 10	2 25	2 45	2 60	2 80	3 00	3 20	3 40
57-67-77		1 55	1 70	1 95	2 20	2 45	2 75	3 10	3 50	3 90	4 30	4 75	5 15	5 60	6 00	6 45
62		1 50	1 60	1 75	1 90	2 10	2 25	2 45	2 65	2 95	3 25	3 55	3 85	4 15	4 45	4 75
66		1 45	1 55	1 65	1 80	1 95	2 10	2 30	2 50	2 75	3 05	3 35	3 60	3 90	4 20	4 50
75-78-88		1 70	2 00	2 45	2 90	3 40	3 90	4 40	4 95	5 50	6 05	6 60	7 15	7 70	8 25	8 80
83-93	$1 65	2 05	2 70	3 50	4 30	5 10	5 90	6 80								
85-95	2 05	2 35	3 05	3 90	4 80	5 70	6 60	7 50	8 40	9 35						
103	1 90	2 20	2 70	3 30	4 00	4 70	5 40	6 10	6 75	7 45	8 10	8 75	9 40	10 05	10 70	11 40

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SPIRAL STEEL CONVEYOR



Prices of Steel Conveyor.

Regular Strength.

Including connecting journals, hangers and curved iron lining for box.

Outside Diameter in Inches.	Price, Per Foot.	Standard Length. Feet.	Inside Diameter of Hollow Shaft. Inches.	Regular Diameter of Projections. Inches.	Maximum Capacity per Hour. Bushels.	Recommended Revolutions per Minute.
3	$1.00	8	1 3/16	1 3/16	60	...
4	1.00	8	1	1	100	100
5	1.67	10	1 1/2	1 1/2	200	140
6	1.67	10	1 1/2	1 1/2	300	140
8	2.00	10	1 1/2	1 1/2	780	150
9	2.00	10	1 1/2	1 1/2	1,000	150
10	2.80	10	1 1/2	1 1/2	1,400	160
12	2.80	12	2	2	2,000	160
14	3.75	12	2	2	3,400	160
16	3.75	12	2	2	5,000	160
16	5.08	12	3	2 1/16	5,000	160
18	6.15	12	3	2 1/16	6,000	160

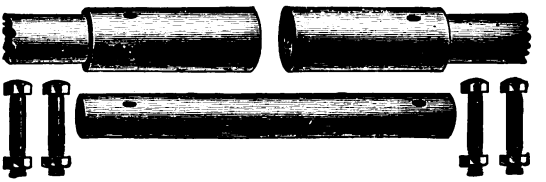
GALVANIZED CONVEYOR

Price List of Galvanized Conveyors.

4-in.	6-in.	9-in.	12-in.	16-in. on 2-in.	16-in. on 3-in.	18-in.
$1.28	$2.03	$2.68	$3.48	$4.83	$6.38	$7.79

The fittings specified in our price list of plain steel conveyors are included in above prices

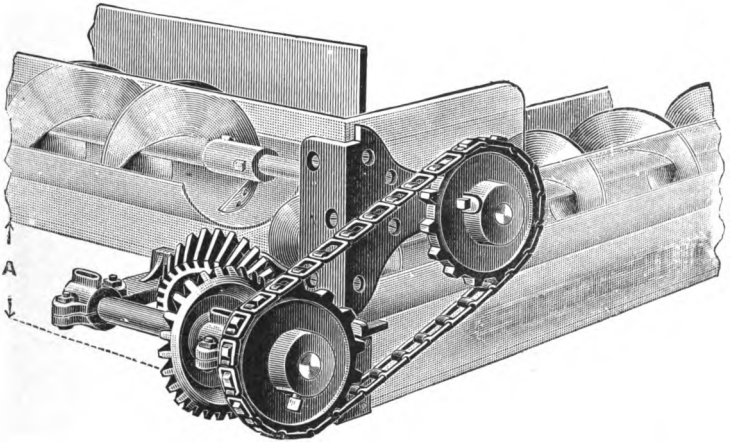
COUPLINGS AND DRIVING ENDS AND METHODS OF SECURING SAME



Diameter of Conveyor, in Inches.	Diameter of Coupling, in Inches.	Price, Each.
4	1	$0.50
6	1 ½	.75
9	1 ½	.75
12	2	1.50
16 on 2-inch pipe.	2	1 50
16 " 3 " "	3	2.50

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IMPROVED RIGHT ANGLE CONVEYOR DRIVE



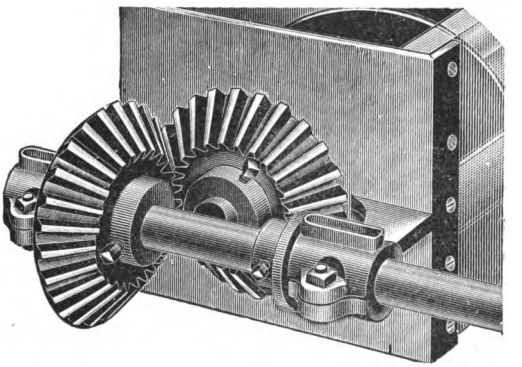
Price List.

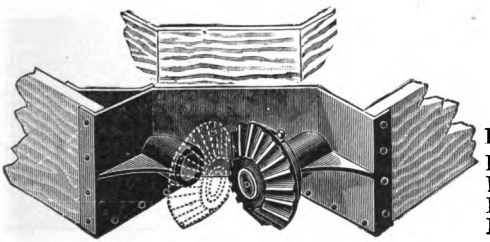
Including the cast-iron box end, necessary drive end projection for the conveyor, gears and short countershaft projection long enough to take sprocket wheel or pulley.

For 4-inch conveyor	$11.50	For 12-inch conveyor	$38.00
For 6 " "	17.50	For 16 " on 2-inch pipe	65.00
For 9 " "	20.00	For 16 " " 3 " "	75.00

COUNTERSHAFT BOX END FOR CALDWELL CONVEYOR

For 6 inch Conveyor	$10.00
For 9 " "	15.00
For 12 " "	26.00
For 16 " "	40.00





MITER GEAR JOURNAL ENDS FOR CONVEYORS WORKING AT RIGHT ANGLES

Price List.

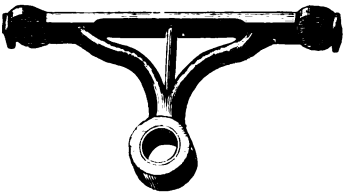
Including Gears. Driving Ends extra.

For 4 inch Conveyor	$ 8.00
For 6 " "	10.00
For 9 " "	18.00
For 12 " "	24.00

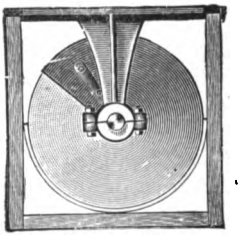
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STANDARD HANGERS FOR BOTH HELICOID AND STANDARD CONVEYORS

No. 1



No. 2

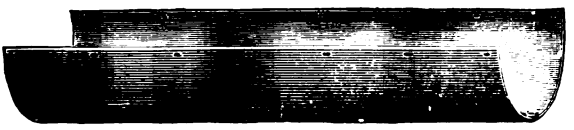


No. 2 is always furnished unless otherwise specified.

Our regular price list includes linings and hangers, but when wanted for repairs or extras we charge as follows:

	Diameter Conveyor					
	4-inch	6-inch	9-inch	13-inch	19-inch 2-in. pipe	16-inch 3-in. pipe
Hangers, each	$0.25	$0.40	$0.55	$1.25	$2.50	$3.00
Flights, each	.20	.30	.45	.75	1.20	1.35
Couplings, each	.50	.75	.75	1.50	1.50	2.50

LININGS



We furnish curved steel lining for conveyor boxes made in regular widths and of standard gauge metal.

PRICE LIST

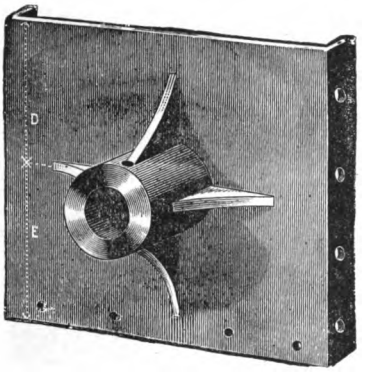
Diameter of Conveyor Inches	Gauge of Steel Inches	Width, Inches	Price per Foot
4	22	8	$0.05
6	22	10	.06
9	20	16	.10
12	20	20	.13
16	18	24	.23
18	18	30	.30

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CAST IRON ENDS FOR CONVEYOR BOXES

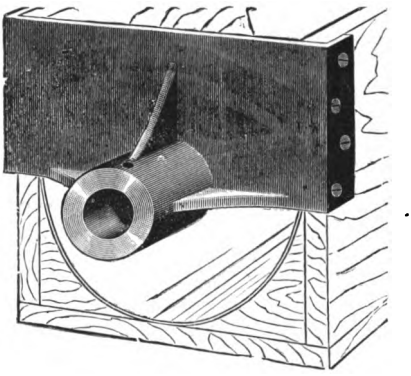
TAKE PLACE OF A HANGER OR BEARING. BEARING BABBITTED.

STYLE A



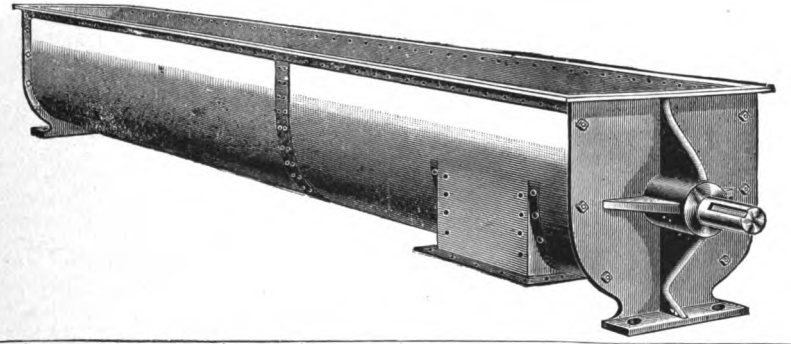
MADE SPLIT FOR 25% EXTRA OVER NET PRICE

STYLE B



Diameter Conveyor, Inches	4	6	8	9	9	10	10	12	12	14	16	16	18
Diameter Shaft, Inches	1	1½	1½	1½	2	1½	2	2	3	2	2	3	3
Price Style A	$1.50	2.00	2.75	3.00	3.25	3.75	4.25	6.00	——	7.50	9.00	10.00	12.00
Price Style B	1.30	1.80	2.50	2.70	2.95	3.40	3.90	5.50	6.25	7.00	8.25	9.00	11.00

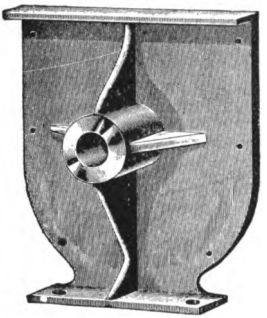
STEEL CONVEYOR TROUGH



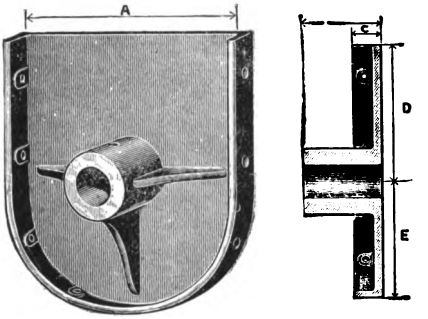
Diameter of Conveyor, Inches	Box: Gauge of Metal, No.	Box: Width of Sheet Inches	Width of Trough	Depth of Trough	Size of Angle Iron, Inches	Cover, Gauge of Metal, No.	Price per Foot, Box	Added Price per Foot for Cover
4	18	15	5	6½	1 x 1 x ⅛	20	$2.00	$0.35
6	16	20	7	8	1¼ x 1¼ x 3-16	18	2.25	.40
8	14	24	9	9½	1½ x 1½ x 3-16	16	2.50	.45
9	14	28	10	11 3-16	1½ x 1½ x 3-16	16	2.75	.50
10	14	30	11	11⅞	1½ x 1½ x 3-16	16	3.00	.55
12	12	36	13	14⅝	2 x 2 x 3-16	16	3.75	.60
14	12	42	15	16½	2 x 2 x 3-16	16	4.25	.70
16	12	48	17	19 3-16	2 x 2 x 3-16	16	4.50	.80
18	10	54	19	21 9-16	2½ x 2½ x ¼	14	6.50	1.20

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CAST IRON BEARING ENDS (BABBITTED) FOR STEEL CONVEYOR BOXES



OUTSIDE PATTERN

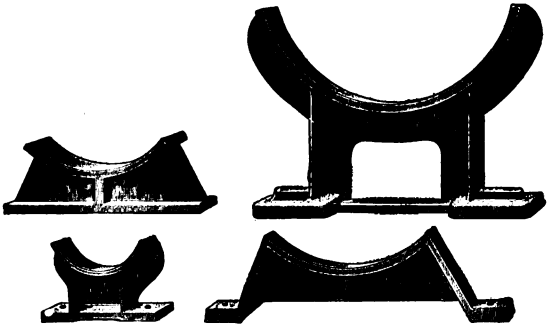


INSIDE PATTERN

Diameter Conveyor, inches	4	6	8	9	9	10	10
Diameter Shaft, inches	1	1½	1½	1½	2	1½	2
Price	$1.50	$2.00	$2.75	$3.00	$3.25	$3.75	$4.25

Diameter Conveyor, inches	12	12	12	14	16	16
Diameter Shaft, inches	2	2 7/16	3	2 7/16	2	3
Price	$6.00	$6.50	$6.75	$7.50	$9.00	$10.00

STEEL CONVEYOR BOX SADDLES



Prices on application.

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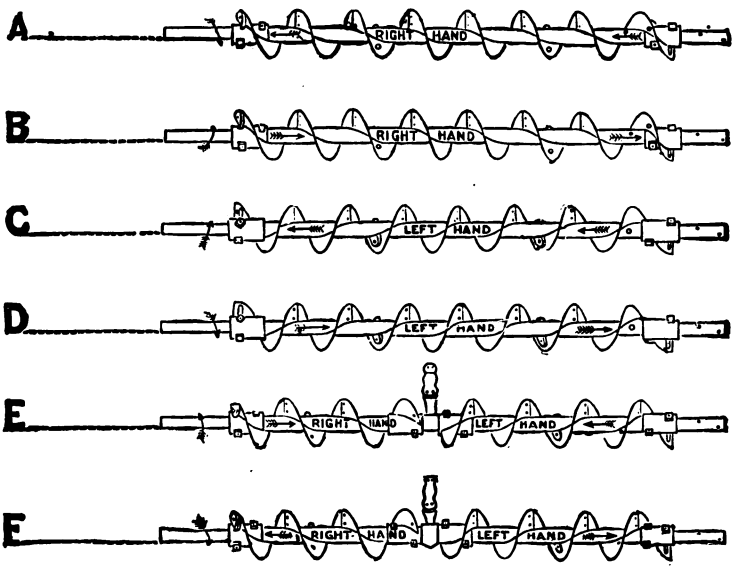
DIRECTIONS FOR ORDERING SPIRAL CONVEYOR

We print below diagrams of right and left hand Conveyors; also conveying both right hand and left hand.

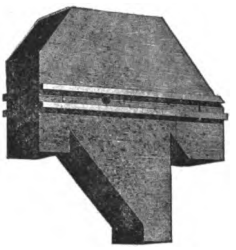
In ordering, send sketch similar to the diagram given below, so that no mistakes may occur.

Conveyor driven by belts will convey either way by crossing the belt. Changing a Conveyor, end for end, does not change from right hand to left hand. In ordering, be sure to give length and diameter of driving ends.

The arrows indicate which way the Conveyor turns and which way the material is carried.



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WOOD ELEVATOR HEADS

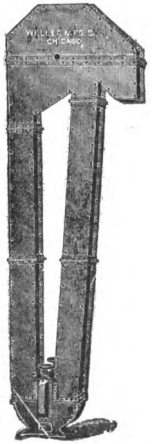
These Elevator Heads are designed to meet the requirements of grain elevators and are made of kiln-dried lumber, have inclined stout board to prevent the dust from accumulating, and if the head pulleys are run at proper speed the elevators will discharge perfectly.

Length of Bucket	Diameter of Pulley in Inches.			
	24	30	36	42
5 in.	$10 00	$12 00	$.....	$.....
6 "	11 00	13 00		
7 "	12 00	14 00	16 50	
8 "	13 00	15 50	18 00	21 00
9 "	14 00	17 00	19 50	23 00
10 "	15 00	18 50	21 00	25 00
11 "		20 00	22 50	27 00
12 "		21 50	24 00	29 00
14 "		23 00	25 50	31 00
16 "		24 50	27 00	33 00

Above price list does not include pulleys, shaftings, bearings or collars, but no charge will be made for the labor of attaching them or distributing spouts when ordered with the heads.

Prices of larger sizes quoted upon application.

Double Legging with Steel Head



STEEL ELEVATOR CASINGS

The most decided advantage in the use of steel construction in Elevator Casings is in the saving of insurance.

We will be pleased to quote prices on receipt of full particulars and measurements.

Single Legging with Steel Head

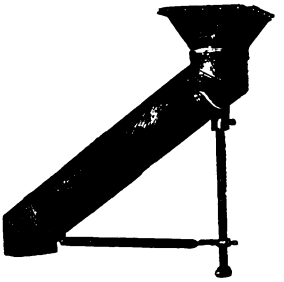


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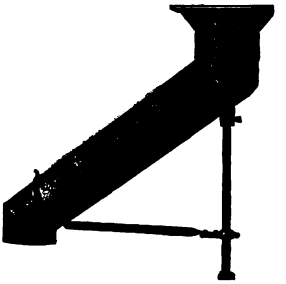
DISTRIBUTING SPOUTS

FOR HEADS OF ELEVATORS

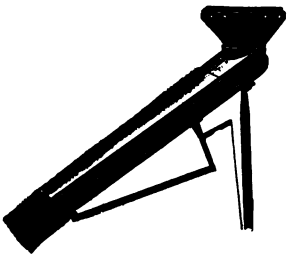
No. 5



No. 6



Crane No. 4



Nos. 5 AND 6 DISTRIBUTING SPOUT

Diameter of Spout Inside, Inches	Price, Style 5, All Steel	Price, Style 6, with Cast Iron Hopper and Elbow	Center of Rod to Center of Discharge, Styles 5 and 6, Inches	Top of Hopper to Bottom of Spout Styles 5 and 6, Inches	Size of Socket for Indicator Rod, Inches
6	$ 9 00	$12 00	30	33	7/8
9	12 00	16 00	36	41 1/4	1
12	15 00	20 00	42	47	1 1/4
14	18 00	24 00	48	54 3/4	1 1/4

Larger spouts or above spouts made to other dimensions if desired. Prices on application.

CRANE DISTRIBUTING SPOUT No. 4

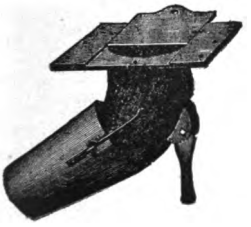
8-inch Crane Spout, for bulk grain $ 7 50
10-inch Crane Spout, for bulk grain 8 50
12-inch Crane Spout, for bulk grain 10 50
12-inch Crane Spout, for ear corn or corn and cobs 12 00
The Indicator Rod shown in cut above is not furnished unless charged for extra.

IMPORTANT

When ordering, always state the size of buckets which will be used with the spout, or, if possible, give inside measures of discharge spout at head of elevator.

The 8-inch spout is suitable for buckets 6 to 9 inches long.
The 10-inch spout is suitable for buckets 9 to 12 inches long.
The 12-inch spout is suitable for buckets 12 to 16 inches long.

Plain



CAST IRON TURN HEADS

The Seeley with Hopper

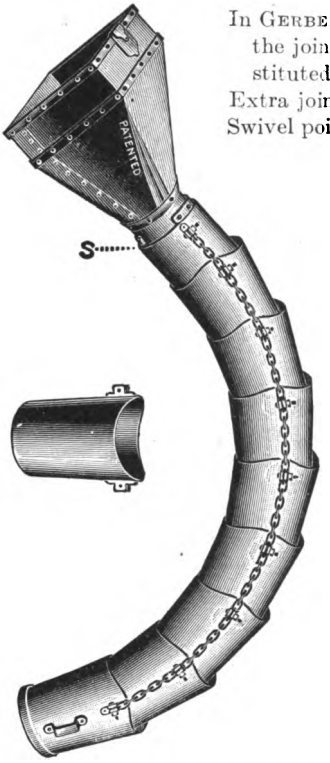


	Plain	Seeley
Size, 6-inch	$ 6 00	$10 00
Size, 8-inch	8 00	
Size, 9-inch	9 00	12 00
Size, 10-inch	10 00	
Size, 12-inch	12 00	15 00

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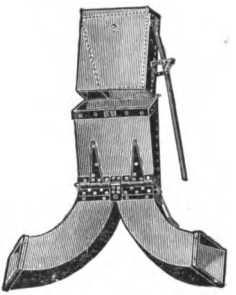
FLEXIBLE CAR LOADING SPOUTS

In GERBER'S PATENT FLEXIBLE TELESCOPE CAR LOADING SPOUT the joints may be removed when worn out and new ones substituted without disturbing either end.
Extra joints at nominal cost.
Swivel point at "S."
Price, $10.00

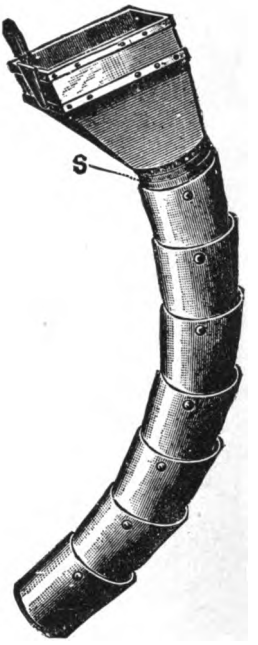


GERBER

Prices, Standard
6 inch.....$10.00
8 inch..... 12.00
10 inch..... 14.00

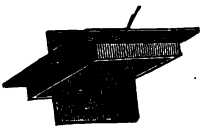


BIFURCATED
Price, $55 Net



STANDARD

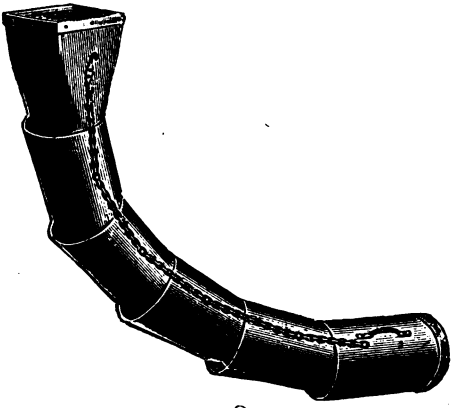
DUMP GATES FOR SCALE HOPPERS



Price, $4.00

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FLEXIBLE SPOUTS—WITH CHAIN CONNECTION



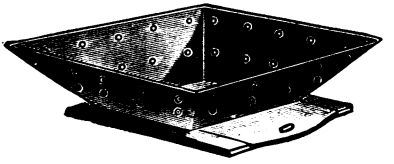
OPEN



CLOSED

Size	Price, No. 18	Price, No. 16	Price, No. 14
6 inches by 5 feet	$ 9.00	$11.00	$12.00
6 " " 6 "	10.00	12.00	13.50
6 " " 8 "	12.00	15.00	16.50
8 " " 6 "	11.00	13.50	17.50
8 " " 8 "	13.50	16.50	19.50
8 " " 10 "	16.00	19.00	22.00
10 " " 6 "	12.50	15.00	19.50
10 " " 8 "	16.50	19.50	21.50
10 " " 10 "	19.50	22.75	26.00

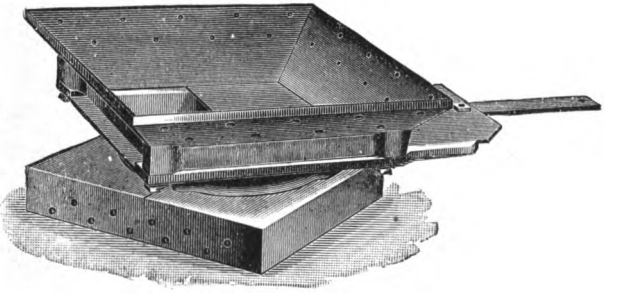
HOPPER BOTTTOMS



STYLE A

Prices, including Slides

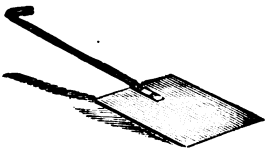
	Style A	Style B
10-inch	$ 8.00	
12 "	10.00	$12.00
14 "	12.00	14.00
18 "	16.00	18.00
24 "	22.00	24.00



STYLE B

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STEEL GATES



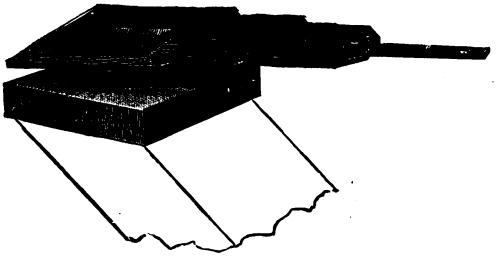
Size of Gates Inches	Price Each	Size of Gates Inches	Price Each	Size of Gates Inches	Price Each
8 x 10	$0.90	12 x 16	$1.45	16 x 24	$2.25
8 x 12	.95	12 x 18	1.55	18 x 20	2.35
8 x 14	1.05	14 x 16	1.65	18 x 24	2.65
10 x 12	1.10	14 x 18	1.75	18 x 28	2.95
10 x 14	1.15	14 x 20	1.90	20 x 24	3.10
10 x 16	1.20	16 x 18	2.00	20 x 30	3.20
12 x 14	1.35	16 x 20	2.10		

Above prices include simply the gate and 3-foot stems. Gates are made with stems of any required length over 3 feet at an additional cost of 8 cents per foot.

CAST IRON GUIDES

Length Inches	Price per Pair	Length Inches	Price per Pair	Length Inches	Price per Pair
12	$0.60	30	$1.15	48	$1.70
14	.65	32	1.20	50	1.75
16	.75	34	1.25	52	1.85
18	.80	36	1.30	54	1.90
20	.85	38	1.40	56	1.95
22	.90	40	1.45	58	2.05
24	.95	42	1.50	60	2.15
26	1.00	44	1.55		
28	1.10	46	1.65		

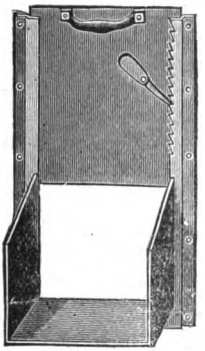
BIN BOTTOMS WITH SLIDES FOR WOOD SPOUTS



Size of Discharge Inches	Gauge of Metal in Slide	Price Each
6	14	$ 4.50
8	14	4.80
9	12	5.20
10	12	6.00
12	10	8.25
14	10	9.25
16	10	11.25
18	3-16	14.25
24	3-16	18.50

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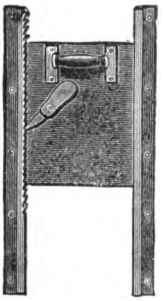
BIN GATES



WITH SPOUT

12 x 14 inches	$3.00
14 x 16 "	3.60
16 x 18 "	4.20
18 x 20 "	4.80
20 x 22 "	5.40
22 x 24 "	6.00

WITH SPOUT



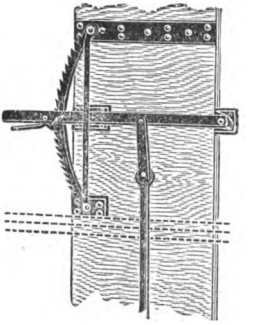
ADJUSTABLE

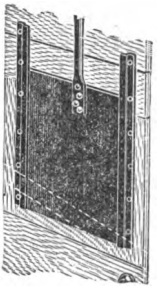
ADJUSTABLE

12 x 14 inches	$2 50
14 x 16 "	3.00
16 x 18 "	3.50
18 x 20 "	4.00
20 x 22 "	4.50
22 x 24 "	5.00

WITH LEVER

14 x 14 x 1/4 inches	$ 9.75
16 x 16 x 1/4 "	10.20
18 x 18 x 1/4 "	10.65
20 x 20 x 1/4 "	11.55
24 x 24 x 5/16 "	13.50
26 x 26 x 5/16 "	14.25
28 x 28 x 5/16 "	15.00

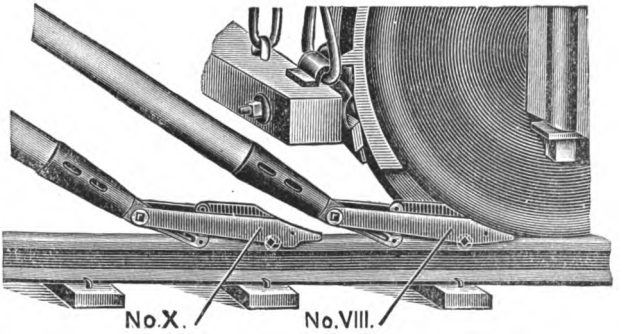




WITH LEVER

THE ATLAS CAR MOVER

The ATLAS CAR MOVER is decidedly the best and most powerful Car Mover on the market, and supersedes all others wherever introduced. Will move a car farther at a stroke, and with less effort, than any other car mover. Gets under the lowest brakes. The metal parts are Malleable Iron and Steel, and the handle is of Hard Maple. The Spur, or Heel, is of the finest Tool Steel; it can be turned and all four corners used.



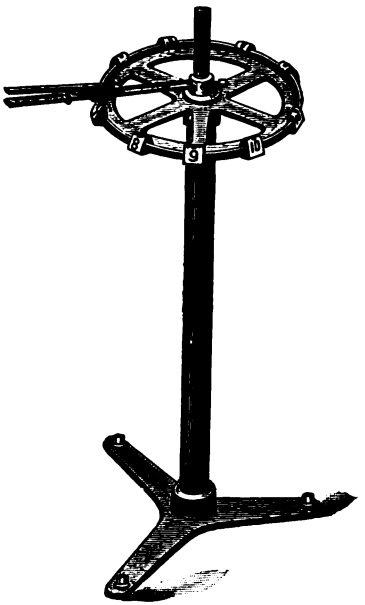
Price, $5.00 each

At beginning of movement

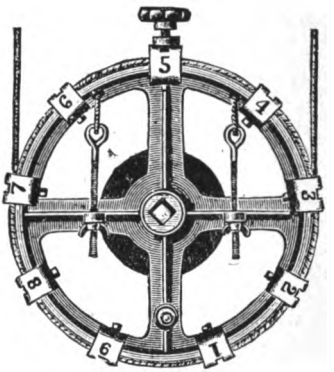
TRY AN ATLAS, IT WILL PAY FOR ITSELF IN A FEW HOURS USE.

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INDICATOR STANDS FOR REVOLVING SPOUTS

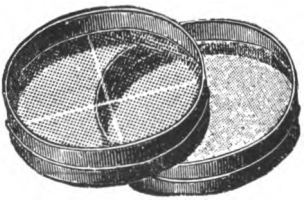


Including stand, hoop with figures and lever $6.00
Indicator hoop, with figures and lever, as shown in cut 3.75
One inch wrought iron pipe for indicator rod, per foot 08
Couplings for indicator rod, each 25



Indicator Wheel with 8 numbers and tightener frame, upper wheel bored for stem of turn spout, but without stem or stem bearing $7.50
Flexible galvanized wire rope, 3/16 inch diameter, per foot, net 03½

TESTING SIEVES AND SCALES



Two Sieves in set, one 3 x 16, other 16 x 16 mesh.... $3.00

SCALES

Capacity one lb., graduated ½ oz. to 16 oz., with percentage graduation, 0 to 100 $9.00

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HERCULES STEEL FLOUR SCOOPS

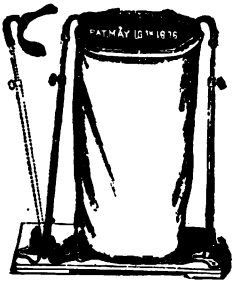


One-half bushel Scoop, each..... $2.50
Bushel Scoop, each..... 3.00

THE CHAMPION FLOUR SCOOP

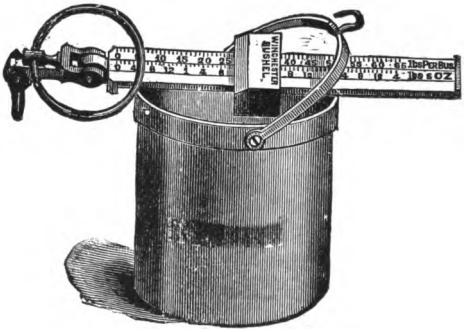
	Tin	Steel	Galvanized Steel
8 inches	$0.60	$0.75	$0.85
10 "	.65	.85	1.00
12 "	.75	1.00	1.10
14 "	1.00	1.25	1.35





"MOSHER" BAG HOLDER

Price, each, $5.00



GRAIN TESTER

1 Pint, each..... $13.00
1 Quart, each..... 14.00
2 Quarts, each..... 15.00

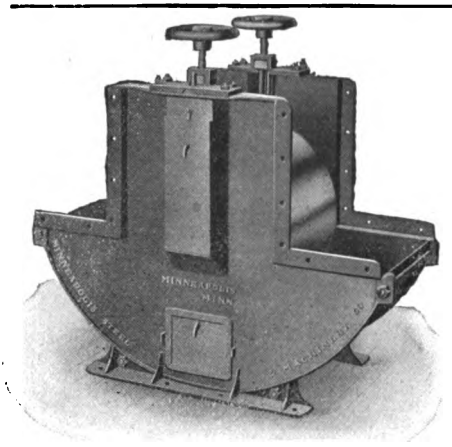
GRAIN SAMPLER



Price, wagon size, 1¼ inches diameter x 36 inches long $ 5.00
" car size, 1¼ " " x 44 " " 8.00
" " 1½ " " x 44 " " 9.00
" " 1¾ " " x 52 " " 10.00

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ELEVATOR BOOTS



CAST IRON

PRICE LIST CAST IRON BOOTS

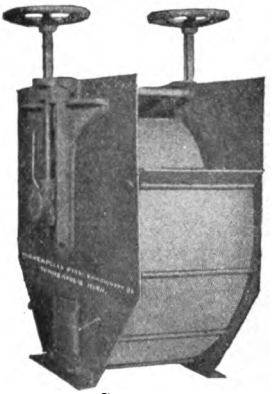
Size of Bucket	Width of Belt	Diam. of Pulley or Wheel	Price of Boot Complete
4	4½	10 x 5	$21.00
5	5½	12 x 6	24.00
6	7	12 x 7	25.00
7	8	14 x 9	27.00
8	9	14 x 10	30.00
9	10	16 x 11	33.00
10	11	16 x 12	37.00
12	13	18 x 14	44.00
14	15	18 x 16	50 00
16	18	20 x 19	65.00
18	20	20 x 21	85.00
20	22	24 x 23	95.00

PRICE LIST CAST STEEL BOOTS

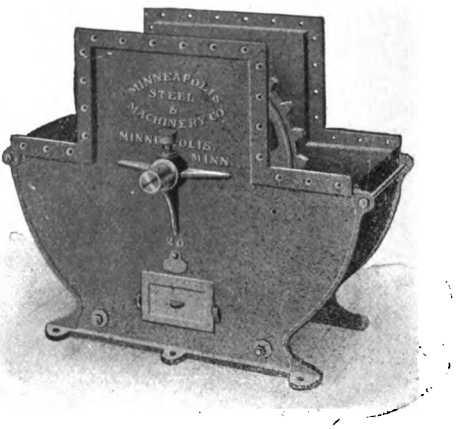
Size of Bucket Inches	Size of Pulley Inches	Width of Belt Inches	Price
5 x 4	10 x 6	5½	$26.00
6 x 4	12 x 7	6½	27.00
7 x 4½	14 x 9	8	32.00
8 x 5, 8 x 6	14 x 10	9	34.00
9 x 5, 9 x 6, 10 x 5½	16 x 11	10	38.00
10 x 6, 10 x 7	16 x 12	11	40.00
11 x 6, 11 x 7	18 x 13	12	44.00
12 x 6, 12 x 7	18 x 14	13	46.00
13 x 6, 13 x 7	18 x 15	14	48.00
14 x 6, 14 x 7	18 x 16	15	50.00
15 x 6, 15 x 7	18 x 17	16	52.00
16 x 6, 16 x 7	20 x 20	18	55.00

SPECIAL
CAST STEEL ELEVATOR BOOTS

For use with Chain Belt Elevators.
Prices on application.



STEEL



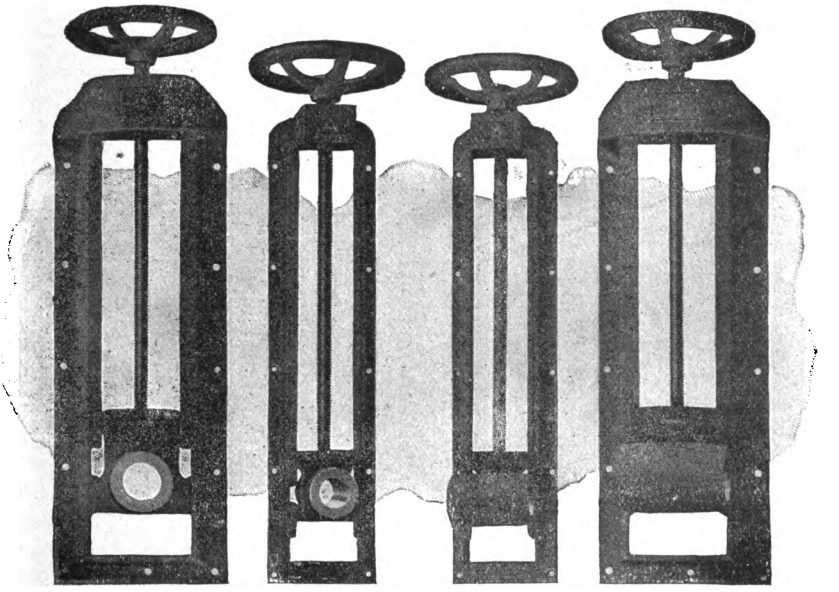
SPECIAL CAST IRON

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TAKE UPS

For use where it is necessary to take up slack in belts, as in elevators. Made to push and pull, as shown.

STYLE A STYLE B



No. of Frame	Diameter of Shaft	Price Pair "A" or "B"	No. of Frame	Diameter of Shaft	Price Pair "A" or "B"
4	11-16	$ 3.50	12	2 7-16	$13.50
4	11-16	3.80	20	2 9-16	19.00
4	15-16	4.00	20	2 11-16	20.00
5	1 3-16	5.10	20	2 13-16	22.00
5	1 5-16	5.40	20	2 15-16	27.00
7	1 7-16	6.50	24	3 15-16	30.00
7	1 9-16	7.00	36	3 15-16	40.00
7	1 11-16	8.00	48	3 15-16	70.00
9	1 15-16	9.50	60	3 15-16	80.00
9	2 3-16	10.00	72	4 7-16	100.00
12	2 5-16	12.50			

The number of frame indicates length of movement in inches.

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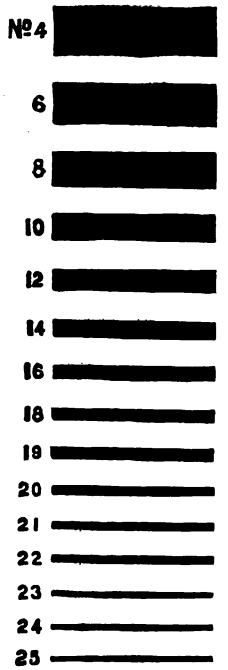
"SALEM" BUCKETS



ARE light, strong, made entirely of steel, and well adapted to handle smooth, finely divided loose material, as grain, etc., etc.

Revised Price List

Capacity: bushels per hour 200 ft. per min. 12 ins. apart.	Size of Bucket. Width	Projection.	Suitable for ordinary Mill and Elevator Work. Gauge of Steel used.	Price.	Ear Corn and Similar Heavy Substances. Gauge of Steel used.	Price.
21	2	x 2 in.	No. 25	$ 04	No. 18	$ 16
40	2½	x 2¼ "	" 24	05	" 18	18
59	3	x 2½ "	" 24	06	" 18	19
69	3½	x 2½ "	" 24	07	" 18	20
87	3	x 3 "	" 23	09	" 16	28
102	3½	x 3 "	" 23	10	" 16	29
116	4	x 3 "	" 23	11	" 16	30
131	4½	x 3 "	" 23	12	" 16	31
159	4	x 3½ "	" 22	12	" 16	33
179	4½	x 3½ "	" 22	13	" 16	34
199	5	x 3½ "	" 22	14	" 16	35
229	5	x 4 "	" 22	18	" 16	39
251	5½	x 4 "	" 21	19	" 16	40
274	6	x 4 "	" 21	20	" 16	41
500	7	x 4½ "	" 20	30	" 16	49
670	8	x 5 "	" 19	41	" 16	59
754	9	x 5 "	" 19	43	" 16	63
973	10	x 5½ "	" 19	54	" 16	76
1220	10	x 6 "	" 18	62	" 16	81
1342	11	x 6 "	" 18	65	" 16	85
1464	12	x 6 "	" 18	68	" 16	89
1708	14	x 6 "	" 18	74	" 16	97
1952	16	x 6 "	" 18	81	" 16	1 05
2196	18	x 6 "	" 18	89	" 16	1 13
2440	20	x 6 "	" 18	95	" 16	1 21
1590	10	x 7 "	" 18	73	" 16	1 01
1749	11	x 7 "	" 18	76	" 16	1 05
1908	12	x 7 "	" 18	80	" 16	1 09
2226	14	x 7 "	" 18	88	" 16	1 17
2544	16	x 7 "	" 18	96	" 16	1 25
2862	18	x 7 "	" 18	1 04	" 16	1 33
3180	20	x 7 "	" 18	1 12	" 16	1 41
3184	16	x 8 "	" 18	1 14	" 16	1 41
3582	18	x 8 "	" 18	1 22	" 16	1 51
3980	20	x 8 "	" 18	1 30	" 16	1 61
4378	22	x 8 "	" 18	1 38	" 16	1 71
4776	24	x 8 "	" 18	1 46	" 16	1 81



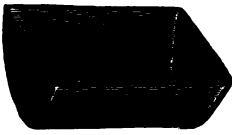
GAUGES OF STEEL used on Salem Buckets

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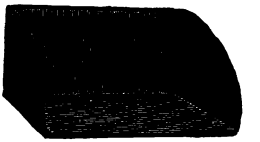
MALLEABLE IRON BUCKETS



STYLE A



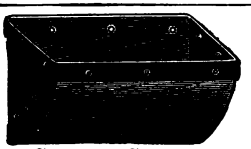
STYLE B



STYLE C

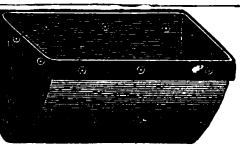
Style A—for Cement, Coal, Pulp, etc.

Length	Width	Depth	Capacity Cubic Inches	Capacity Quarts	Price
4	2¾	2½	13	.2	$0.20
5	3½	3	25	.4	.35
6	4	3½	50	.74	.45
7	4½	4	60	.86	.55
8	5	4	108	1.6	.65
10	6	5	160	2.37	.90
12	6	5	280	4.	1.15
12	7	5½	300	4.4	1.25
14	7	5½	350	5.1	1.75
18	10	7	1175	17.5	4.00
Style B—for Ores in inclined elevators.					
4	1½	1	4	.4	$0.15
8	3½	2½	48	.7	.50
10	4	3	60	.9	.70
12	5½	4	135	2.	.90
Style C—for Sugar, Clay, and sticky material.					
8	4½	4	84	1.	$0.50
10	5	4	120	1.5	.70
12	5	4	144	2.	.90
16	7	5½	380	6.5	1.80



COMMON SENSE

TIN AND STEEL ELEVATOR BUCKETS



EMPIRE

TIN MILL BUCKETS

2½x2¼	$0.08	4 x3	$0.12	5 x4	$0.16
3 x3	.09	4½x3½	.14	5½x4	.17
3½x3	.10	4 x3½	.13	6 x4	.18

STEEL GRAIN BUCKETS

5 x4	$0.16	8x5	$0.25	11x6	$0.40
5½x4	.17	9x5	.28	12x6	.44
6 x4	.18	10x5½	.35	14x6	.50
7 x4½	.22				

STEEL EAR CORN BUCKETS

7x5	$0.33	10x6	$0.44	13x7	$0.62
8x5½	.36	11x7	.56	14x7	.65
9x6	.40	12x7	.59		

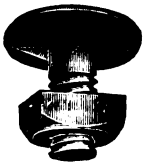
GALVANIZED BUCKETS

6x4	$0.30	9x5	$0.45	12x6	$0.65
7x4½	.35	10x5½	.55	14x6	.70
8x5	.40	11x6	.60		

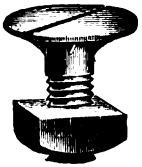
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ELEVATOR BUCKET BOLTS

FAVORITE SLOTTED HEAD BOLTS



This Bolt is provided with ribs under the head which is slotted and enables the latter to be held by a screw driver when the nut is turned.

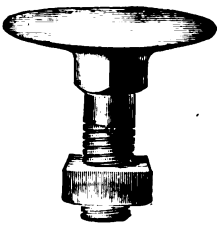


PRICE LIST.

5/16 x 1/4 inch	per 100, $1.00	3/4 x 1/4 inch	per 100, $1.00
3/8 x 1/4 inch	" 1.00	7/8 x 1/4 inch	" 1.15

NORWAY OR FLAT HEAD BOLTS

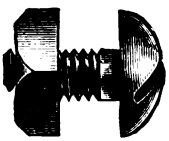
Our Norway Bolts are made with extra large thin flat heads very carefully finished.



PRICE LIST.

5/16 x 1/4 inch	per 100,	$2.00
3/4 x 1/4 "	"	2.20
7/8 x 1/4 "	"	2.30
1 x 1/4 "	"	2.30
1 1/4 x 1/4 "	"	2.40
1 1/2 x 5/16 "	"	3.20

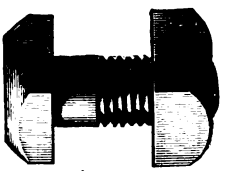
BOLTS FOR CHAIN ATTACHMENTS



Button Head for Light Chains.

PRICE LIST.—Button Head.

1/4 x 5/8 inch	per 100, $1.00
1/4 x 3/4 "	" 1.00

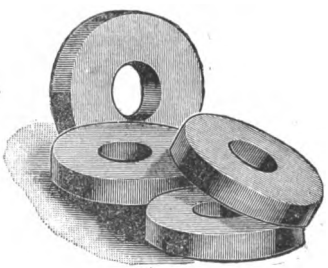


Square Head for Heavy Chains.

PRICE LIST.—Square Head.

5/16 x 3/4 inch	per 100,	$2.00
5/16 x 1 "	"	2.00
3/8 x 1 "	"	2.25

Leather Washers for bolts, 25c per hundred.



LEATHER WASHERS

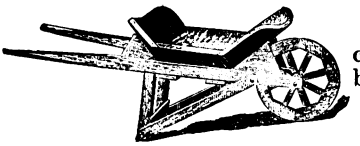
FOR BOLTS

Per 100, 25 cents.

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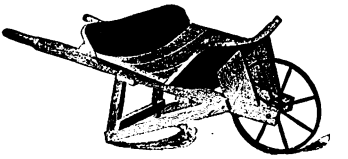
WHEELBARROWS

STANDARD BOLTED



Made same as the Majestic shown below, except has not the Patent Tray. Legs and side braces well bolted. Steel or Wood Wheel. Prices on application.

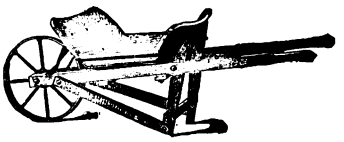
MAJESTIC BARROW



The Majestic barrow has a common size Majestic bolted tray, mounted on Standard bolted frame, side rails and legs bolted to handles and stretcher bolted to legs. Wheel revolves on bolt which passes through both handles, bolting them together, which braces and strengthens the frame where the greatest strain comes. This makes the best low price wheelbarrow on the market, as it has the Majestic bolted tray.

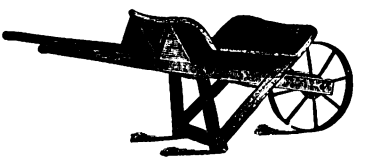
Made with 16-inch Sectional Felloe Wood Wheel, or 16-inch Steel Wheel. Prices on application.

MICHIGAN FULL BOLTED BARROW



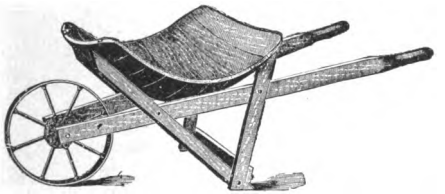
Has extra heavy handles, bolted tray, frame and legs. Front of tray iron braced. Wood cleats extending from the handles up the front of tray to its top, and bolts going through the tray, wood cleat and iron brace. Four bolts through bottom of tray and through handles. Bolted in the back to the legs. Under side of tray cleated and strapped. Full bolted and the best we make. Made with 18-inch Section Felloe Iron Hub Wheel or Steel Wheel. Prices on application.

SUPERIOR BARROW



Our Superior barrow has proven to be a very popular one. Has full size tray well bolted to front brace and to handles. Trays have a wood cleat nailed across each end to keep them from checking. Made with steel or Wood Wheel. Prices on application.

NEW WESTERN BARROW



Tray made of nine staves with rods through each end. Frame bolted. Tray bolted to front braces. Made of hard wood, and so the tray sets well up in front. Made with Steel Wheel or with Wood Wheel. Prices on application.

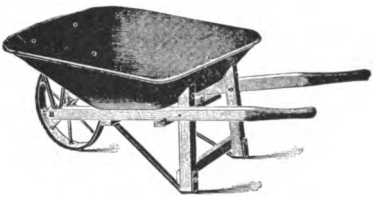
Send for complete wheelbarrow catalogue.

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WHEELBARROWS—CONTINUED

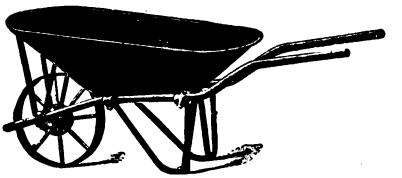
"COLUMBIAN" STEEL TRAY BARROW

SOLID STAMPED STEEL TRAY



Well finished and painted. A good barrow for heavy or rough work.

TUBULAR BARROW



Edge of trays turned over $\frac{5}{16}$ steel rod except No. 6, which is flanged.

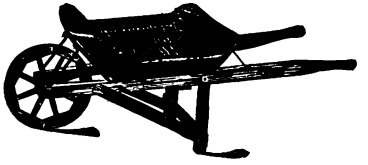
DIMENSIONS AND PRICES OF "COLUMBIAN" STEEL TRAY BARROW

Number	Thickness of Tray	Size of Tray on Top, Inches	Depth of Tray at Wheel End, Inches	Capacity, Cubic Feet	Weight, Pounds, About	Price, Each
1	15 ga.	33 x29	7	3	58	$ 8 00
4	14 ga.	36½x29	8½	4	60	10 00
7	15 ga.	41½x33	11½	6	67	15 00

DIMENSIONS AND PRICES OF TUBULAR BARROW

Number	Thickness of Tray	Size of Tray on Top, Inches	Depth of Tray at Wheel End, Inches	Depth of Tray, Handle End, Inches	Capacity, Cubic Feet	Weight, Pounds, About	Price, Each
1	15 ga.	33 x29	7	5	3	70	$12 00
2	14 ga.	33 x29	7	5	3	83	13 00
3	12 ga.	33 x29	7	5	3	95	15 00
4	14 ga.	36½x29	8½	6	4	78	15 00
5	12 ga.	36½x29	8½	6	4	97	18 00
6	10 ga.	36½x29	8½	5¾	4	105	20 00
7	15 ga.	41½x33	11½	8	6	95	20 00

EMPIRE IRON BRACED WHEELBARROW



The Empire Wheelbarrow has large size Majestic bolted tray; braces, legs and tray are bolted; steel braces used in front and back of tray; wood cleats held with two bolts extend down front of tray, which protects the front and prevents its splitting. This is the easiest of any canal barrow to set up. Made with 16 inch iron hub sectional felloe wheel, or with 16 inch steel wheel. Prices on application.

STONE BARROW



Bent handles 6 feet long, 2x3 inches, dressed. Cross-piece 2x3 inches. Bottom 26 inches wide. 27 inches long. Dash 11 inches high, made of 1½ inch hardwood, dressed. This barrow is made for very heavy work, is well ironed and thoroughly bolted. Painted dark red.

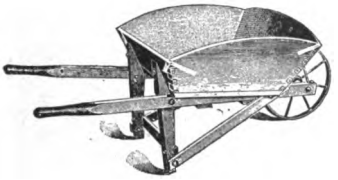
With extra heavy 18 inch iron hub sectional felloe wheel.....Per doz. $.....
With steel wheel..... " $.....

Send for complete wheelbarrow catalogue.

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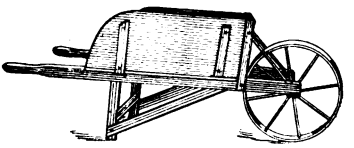
WHEELBARROWS—CONTINUED

MORTAR WHEELBARROW



Box dovetailed and iron bound and well bolted to frame. Front iron braced and legs gained and bolted. Painted brown. Made with Steel or Wood Wheel. Prices on application.

MO. GARDEN WHEELBARROW

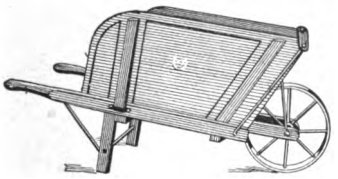


This is a popular *low price* wheelbarrow, and is made to meet the demand for a *strong* and full sized Garden wheelbarrow that can be sold at a reasonable figure.

The bottom is put on crosswise and well nailed to the handles, making a rigid frame.

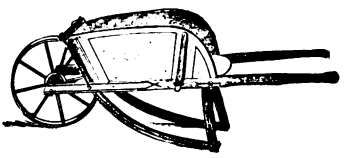
Size of Box, 19 inches wide at wheel; 25 inches wide at handle; 28 inches long; 12 inches deep; has 20-inch Steel Wheel. Painted red. Furnished with Steel Wheel only. Prices on application.

LAWN AND STABLE WHEELBARROW



Extra large and extra strong. Box 32 inches long; 25 inches wide; 18½ inches deep. Well painted. Prices on application.

GLORY GARDEN WHEELBARROW



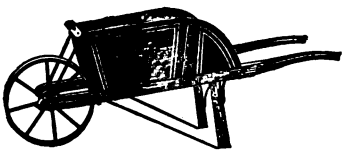
No. 1. Box 30 in. long, 21 in. wide wheel end, 26 in. wide handle end.

No. 2. Box 30 in. long, 19 in. wide wheel end, 24 in. wide handle end.

No. 3. Box 27½ in. long, 16½ in. wide wheel end, 21½ in. wide handle end.

Painted green. With Wood or Steel Wheels.

NEW ENGLAND GARDEN WHEELBARROW



No. 6. Box 29½ inches long.
No. 5. Box 28½ inches long.
No. 4. Box 26½ inches long.
No. 3. Box 25 inches long.
No. 2. Box 21 inches long.

Further details and prices on application. Send for complete wheelbarrow catalogue.

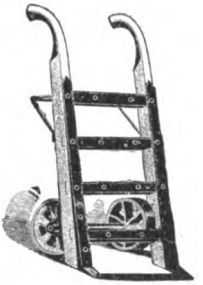
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TRUCKS

Western Half Bound



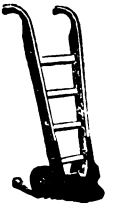
Western Full Bound
Nos. 21 to 24



Barrel Truck



Valley
Bag Truck



WESTERN PATTERN, HALF BOUND TRUCK

Steel Noses, Forged Axies, Turned Bearings, Wheels Bored.

No.	Weight, lbs. about	Length of Handles, Inches	Diameter of Wheels, Inches	Width, Inches	Price each with Rubbered Wheels	Price each with Iron Wheels
0	32	42	6	18	$12 50	$ 6 00
1	43	48	7½	19	15 00	7 00
2	65	52	8½	20	18 50	9 00
3	84	56	9½	22	26 00	13 00
4	115	62	10½	24	34 00	17 00

WESTERN PATTERN, FULL BOUND TRUCK

21	49	48	7½	19	$16 00	$ 8 00
22	70	52	8½	20	20 00	10 50
23	90	56	9½	22	28 00	15 00
24	125	62	10½	24	34 50	18 50

BARREL TRUCK

No. 62. Weight about 75 pounds; length of handles, 52 inches; diameter of wheels, 8½ inches; Width, 20 inches.

Price, each, with Rubbered Wheels.....$20 00
Price, each, with Iron Wheels..... 11 00

VALLEY BAG TRUCK

Steam Bent Handles, Cast Iron Nose, Axles Turned and Wheels Bored. Length of Handles, 42 inches; width at nose, 11⅛ inches; width at upper bar, 16¾ inches; diameter of wheels, 6 inches. Weight about 23 pounds.

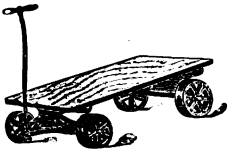
Price, each, Iron Wheels.....$5 00
Price, each, Rubber Wheels..... 8 00

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TRUCKS—CONTINUED

WAGON TRUCK

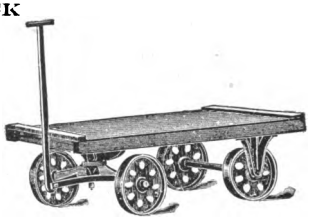
Axles Turned, Wheels Bored. A Substantial Truck.



No.	Size of Platform	Weight Each, lbs. about	Size of Wheels, Inches	Price each
82	3 ft. 4 in. x 2 ft. 4 in.	125	7½ x 2	$16 00
83	3 ft. 6 in. x 2 ft. 6 in.	145	7½ x 2	17 50
84	4 ft. x 3 ft.	160	8½ x 2½	20 00

HEAVY WAGON TRUCK

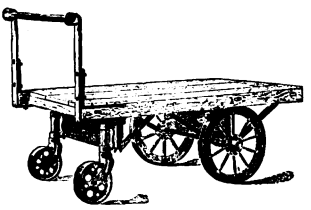
Axles Turned, Wheels Bored.



No.	Length of Platform, Ft.	In.	Width of Platform, Ft.	In.	Size of Wheels, Inches	Size of Front Axle, Sq. In.	Diam. of Rear Axle, Inches	Weight lbs. about	Price
1	5	0	3	0	10½ x 3	1¼	1¼	235	$30 00
2	5	0	3	0	14 x 2½	1¼	1¼	275	36 00

THE IMPROVED TRUCK

With Ball Bearing Casters.

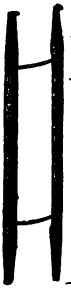


Trucks numbered 1 to 8 inclusive, with patent rubber tired wheels and casters. Price, $12 extra, per truck.

Trucks numbered 9 to 23 inclusive, with patent rubber tired wheels and casters. Price, $24 extra per truck.

	No.	Size of Platform, Feet	Size Over All, Feet	Size of Wheels, Inches	Size of Casters, Inches	Capacity, Lbs.	Weight, Lbs. about	Price, Each
	0	2 x3	2 x3⅓	12 x 2	6 x 1¼	1,200	115	$24 00
	1	2 x4	2 x4⅓	12 x 2	6 x 1¼	1,200	120	25 00
	4	2 x5	2 x5⅓	12 x 2	6 x 1¼	1,200	130	26 10
	5	3 x4	3 x4⅓	12 x 2	6 x 1¼	1,200	140	27 00
	8	3 x5	3 x5⅓	12 x 2	6 x 1¼	1,200	155	29 25
For Very Heavy Work.	11	2½x4	2½x4⅓	18 x 2¼	9 x 1½	3,000	210	31 50
	15	3 x4	3 x4⅓	18 x 2¼	9 x 1½	3,000	225	32 25
	19	2 x6	2 x6⅓	18 x 2¼	9 x 1½	3,000	220	33 00
	21	3 x5	3 x5⅓	18 x 2¼	9 x 1½	3,000	240	35 25
	23	3 x8	3 x8⅓	18 x 2¼	9 x 1½	3,000	290	40 00

SKIDS



No.	Length and Kind.	Dimensions of Side Rails, Inches	No. of Cross Bars	Weight in lbs., each
1	6 ft. Light	1¼ x 2¾	2	24
2	6 ft. Heavy	1¾ x 3	2	36
3	7 ft. Light	1½ x 2¾	2	28
4	7 ft. Heavy	1¾ x 3¼	2	40
5	8 ft. Light	1½ x 2¾	3	30
6	8 ft. Heavy	1¾ x 3½	3	48
7	9 ft. Heavy	1¾ x 3½	3	52
8	10 ft. Heavy	1¾ x 3¾	3	60
9	12 ft. Heavy	1¾ x 4	4	90

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HOPPER SCALES

WITH SINGLE PILLAR

Nos.	Capacity		Size of Platform, Inches	Platform to Pillar, Inches	Opening for Hopper, Inches	Price
	Bush.	Pounds				
199	150	9,000	48x48	16	22x22	$175 00
197	125	7,500	48x48	16	22x22	160 00
195	100	6,000	48x48	16	22x22	140 00
180	60	3,600	36x43	11	22x22	105 00
182	40	2,400	28x36	9¼	19x19	92 00
184	30	1,800	28x36	9¼	19x19	84 00

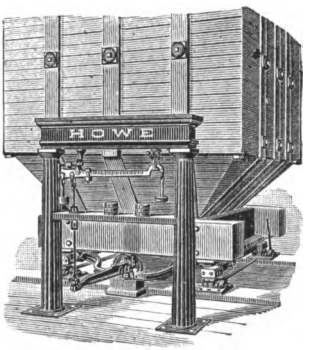


BREWERS' HOPPER SCALES, WITH SINGLE PILLAR

No. 273. Capacity, bu. 100, lbs. 6,000; size of platform, 48x48 inches; platform to pillar, 28¼ inches; opening for hopper, 36x36 inches.....Price, $140 00

Beams on scales of 100 bushels and over are graduated by 1 pound to 300 pounds; 60 bushels and under, ½ pound to 100 pounds.

The above prices are exclusive of the hopper, which is to be furnished by the purchaser.

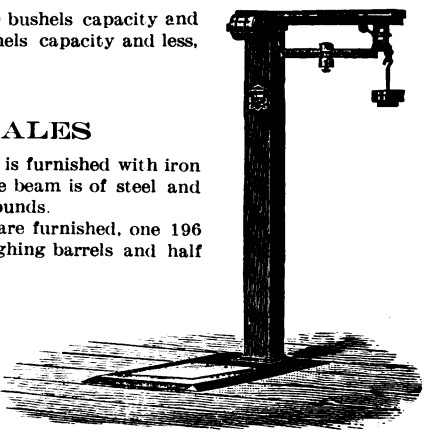


HOPPER AND ELEVATOR SCALES

WITH LEVELING ATTACHMENT

Nos.	Capacity, Bush.	Size of Platform	Distance Center of Opening to Rod	Price
551	1,600	8 ft. 6 in. x 7 ft. 0 in.	6 ft. 7 in.	$900 00
553	1,400	8 " 6 " x 7 " 0 "	6 " 7 "	800 00
555	1,200	8 " 6 " x 7 " 0 "	6 " 7 "	700 00
185	1,000	8 " 6 " x 7 " 0 "	6 " 7 "	600 00
187	800	8 " 6 " x 7 " 0 "	6 " 7 "	475 00
189	700	8 " 6 " x 7 " 0 "	6 " 7 "	430 00
191	600	8 " 0 " x 7 " 0 "	6 " 0 "	390 00
186	500	8 " 0 " x 7 " 0 "	6 " 0 "	350 00
188	400	8 " 0 " x 7 " 0 "	6 " 0 "	320 00
190	350	8 " 0 " x 7 " 0 "	6 " 0 "	300 00
192	300	8 " 0 " x 7 " 0 "	6 " 0 "	285 00
194	200	8 " 0 " x 7 " 0 "	6 " 0 "	225 00
196	150	9 " 0 " x 7 " 0 "	5 " 7 "	205 00
198	125	8 " 0 " x 6 " 0 "	5 " 6 "	180 00
200	100	8 " 0 " x 6 " 0 "	5 " 6 "	155 00

The size of opening for hopper on scales of 200 bushels capacity and upwards is 56 inches square; on scales of 150 bushels capacity and less, 54 inches square.



DORMANT FLOUR SCALES

This scale is very accurate and sensitive. It is furnished with iron frame, the pillar and cap only being of wood. The beam is of steel and nickel plated and graduated by ½ pounds to 100 pounds.

It has, in addition to the regular weights that are furnished, one 196 pound weight and one 98 pound weight, for weighing barrels and half barrels of flour.

No. 210. Capacity, 600 pounds; platform, 17x25 inches; platform to pillar, 4¾ inches; extreme size of floor opening, 37¼x18¼ inches.
Price..... $40 00

Send for complete scale catalogue.

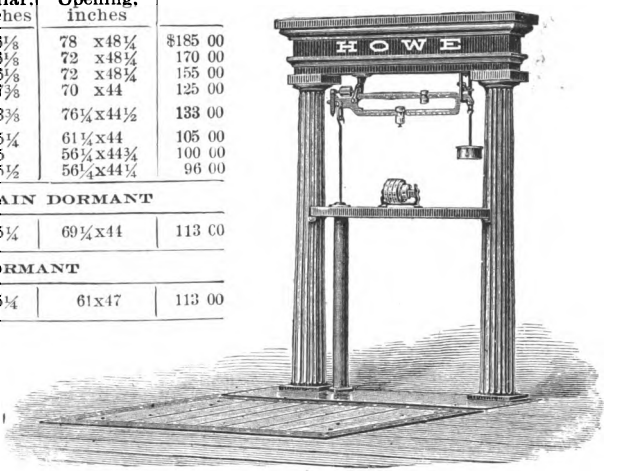
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DORMANT WAREHOUSE SCALES

With two iron pillars, double brass beam, upper bar graduated by ½ pounds to 100 pounds; lower bar 1 pound to 200 pounds, and graduated counterpoise and weights.

Brass Counterpoises and Weights, or Scales with Compound Beams requiring no weights, furnished to order.

New Nos.	Capacity, pounds	Platform, inches	Platform to Pillar, inches	Extreme Size of Floor Opening, inches	Price
215	6,000x½	48x54	16⅛	78 x48¼	$185 00
164	5,000x½	48x48	16⅛	72 x48¼	170 00
169	4,000x½	48x48	16⅛	72 x48¼	155 00
166	3,500x½	43x45	17⅜	70 x44	125 00
183	3,500x½	43x45	23⅜	76¼x44½	133 00
With extra long neck					
138	2,500x½	36x38	15¼	61¼x44	105 00
538	1,500x½	44x34	15	56¼x44¾	100 00
540	1,200x½	43x33	15½	56¼x44¼	96 00
CALIFORNIA GRAIN DORMANT					
137	2,500x½	38x46	15¼	69¼x44	113 00
CLOTH DORMANT					
208	2,500x½	46x38	15¼	61x47	113 00

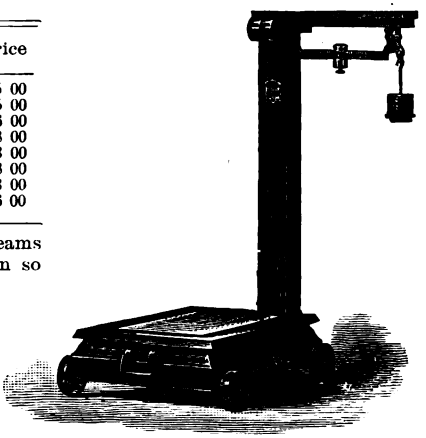


PORTABLE PLATFORM SCALES, WITH WHEELS

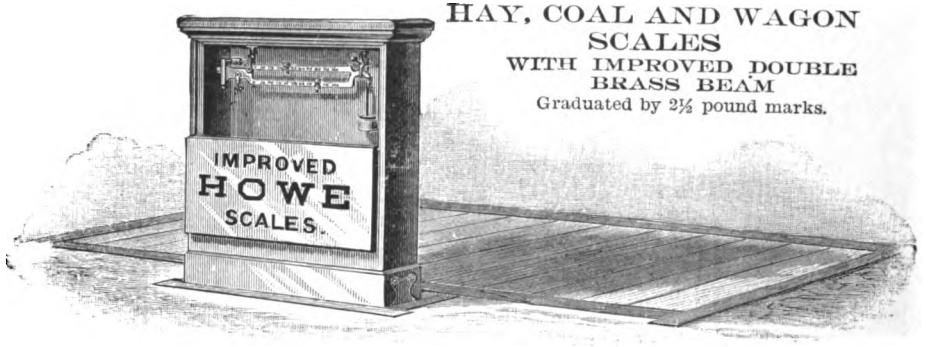
New Nos.	Old Nos.	Capacity Lbs.	Platform In.	Price
18	4	2,500 x ½	26 x 34	$85 00
22	5	2,000 x ½	23 x 32	75 00
24	6	1,500 x ½	21 x 30	56 00
26	7	1,200 x ½	19 x 28	48 00
28	8	1,000 x ½	17 x 26	43 00
29	8½	800 x ¼	17 x 24	38 00
30	9	600 x ¼	16 x 24	33 00
32	10	400 x ¼	15 x 22	26 00

Nos. 30 and 32 Scales furnished with beams graduated by decimals of a pound when so ordered.

NOTE—These Scales may be furnished with Pillar Guards to prevent bags leaning against the pillar at a slight additional cost.



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HAY, COAL AND WAGON SCALES

WITH IMPROVED DOUBLE BRASS BEAM

Graduated by 2½ pound marks.

Nos.	Capacity	Platform	Edge of Platform to Beam Rod	Price
244	20 tons	22 x 8 feet	2 feet 4 inches	$450 00
246	15 "	22 x 8 "	2 " 4 "	400 00
247	15 "	20 x 8 "	2 " 4 "	400 00
248	10 "	22 x 8 "	2 " 4 "	330 00
249	10 "	20 x 8 "	2 " 4 "	330 00
250	10 "	18 x 8 "	2 " 4 "	315 00
251	10 "	16 x 8 "	2 " 4 "	315 00
252	10 "	15 x 8 "	2 " 4 "	300 00
253	10 "	14 x 8 "	2 " 4 "	300 00
254	8 "	22 x 8 "	2 " 4 "	300 00
255	8 "	20 x 8 "	2 " 4 "	300 00
256	8 "	18 x 8 "	2 " 4 "	285 00
257	8 "	16 x 8 "	2 " 4 "	285 00
258	8 "	15 x 8 "	2 " 4 "	270 00
259	8 "	14 x 8 "	2 " 4 "	270 00
260	6 "	22 x 8 "	2 " 4 "	265 00
261	6 "	20 x 8 "	2 " 4 "	265 00
262	6 "	18 x 8 "	2 " 4 "	250 00
263	6 "	16 x 8 "	2 " 4 "	250 00
264	6 "	15 x 8 "	2 " 4 "	225 00
265	6 "	14 x 8 "	2 " 4 "	225 00
266	5 "	15 x 8 "	2 " 4 "	200 00
267	5 "	14 x 8 "	2 " 0 "	200 00
269	4 "	22 x 8 "	2 " 4 "	225 00
268	4 "	14 x 8 "	2 " 0 "	165 00
271	4 "	14 x 8 "	2 " 4 "	165 00
270	3 "	14 x 8 "	2 " 0 "	145 00

These Scales require a total depth of only 20 to 28 inches. The cost of preparing a foundation for any of the above Scales is less than that for other Scales generally in use.

Timber, work and foundation for any of the above Scales to be furnished by the purchaser.

Pillars and Cap, 3, 4 and 5 tons, extra $50 00
Pillars " " 6, 8 and 10 " " 60 00
Short Pillars, Shelf and Hangers, ex. $25 00
Beam Boxes, extra 15 00

Extensions to carry beam additional distance from platform, for 2 feet, $12 00; for each additional foot, $2 00.

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WASTE



We carry a very large and complete stock of white and colored cotton waste—our grades do not change—our customers can depend upon getting the same quality at all times.

PUT UP IN BALES OF ABOUT 100 POUNDS EACH

No. 1 Machine Copped White Cotton Waste
No. 2 Machine Copped White Cotton Waste
No. 1 Colored Cotton Waste
No. 2 Colored Cotton Waste

PRICE PER POUND ON APPLICATION

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OILS AND GREASES



OILS

"U. S." Cylinder Oil
"U. S." Red Engine Oil
"U. S." Dynamo Oil
"Invincible" Cylinder Oil
"U. S." Gas Engine Oil
"U. S." Winter Lubricating Oil
"U. S." Summer Lubricating Oil

COST OF PACKAGES

One gallon can, each	$0 15	Five gallon can, each	$0 50
Two " " "	25	Ten " " "	75
Three " " "	35	Half barrels, each	75

CUP GREASE

Nos. 1, 2, 3, 4 and 5 cup grease, in barrels, per lb	$....
Nos. 1, 2, 3, 4 " 5 " " 25 and 50 lb. tins	
Nos. 1, 2, 3, 4 " 5 " " 10-pound tins	
Nos. 1, 2, 3, 4 " 5 " " 5-pound "	

Nos. 1 and 2 are soft; Nos. 3 and 4 are medium; No. 5 is hard.

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IN

ROGERS BABBIT METALS

WE OFFER YOU THE BEST **THAT**



EXPERIENCE CAN PRODUCE

"ROGERS SPECIAL" BABBITT METAL

For all steam and belt-driven machinery. Is made from all new and high grade anti-friction metals, thoroughly refined and mixed to meet the requirements of any speed or weight. Satisfaction guaranteed.

"ROGERS EXTRA" BABBITT METAL

A copper-hardened metal for use in heavy rolls of steel mills, ore and rock crushers, gas and gasoline engines and machinery where heavy hammer blows occur.

"ROGERS NICKEL" BABBITT METAL

A tin base, nickel-hardened metal, made especially for armature bearings of street car motors, gas and gasoline engines and work where a very hard, tough metal is required.

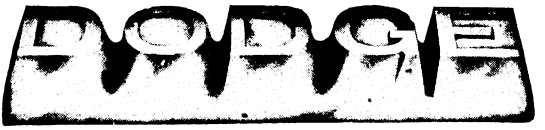
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SAMSON ANTI-FRICTION BABBITT METAL



Best for high speed engines, dynamos, and machinery bearings of all kinds. Incomparable for strength, durability and wearing qualities.

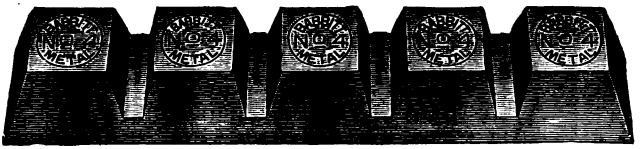
DODGE BABBITT METAL



FRICTIONLESS BABBITT METAL



No. 4 BABBITT METAL



Samson Babbitt Metal	Per lb.	$....
Dodge " "	" "	
Frictionless " "	" "	
Genuine " " No. 1	" "	
No. 4 Special Babbitt Metal	" "	

LADLES

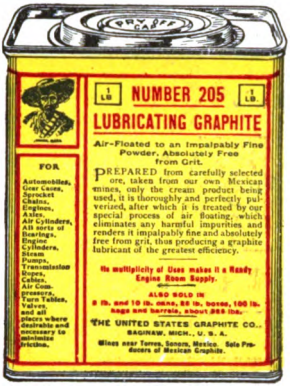


Size	Inch	2½	3	3¼	4	5	6
Price	Per doz.	$3 75	4 65	5 50	6 50	8 75	10 00
EXTRA HEAVY							
Size	Inch	7		8	9		10
Price	Per doz.	$22 00		28 00	45 00		54 00

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MEXICAN GRAPHITE

THE NEW GRAPHITE LUBRICANT



No. 205 Lubricating Graphite is an air-floated Graphite *Powder* impalpably fine and absolutely free from grit.

It excels Flake Graphite in several ways for lubricating purposes.

For one thing, being impalpably fine—air-floated—it will remain perfectly suspended in oil for an indefinite period, thus feeding through any Lubricator without clogging.

So every drop of oil carries its mite of Graphite.

And there's nothing like Graphite to stop that pounding, squealing or groaning that's so annoying.

Another thing: This Powdered Graphite is peculiarly adhesive and "stays put" better than the flake product—that is it doesn't rub off easily, but works into all little irregularities, *stays there*, evens them up and makes smooth, mirror-like, almost frictionless surfaces of the parts in play.

It is a sure preventive and cure for groaning cylinders, hot boxes, hot pins, etc.

And if mixed regularly with your lubricants will reduce oil consumption at least one-fourth.

So don't confuse it with Flake Graphite.

But when your engine gets a bit "rheumatic" and refuses to run just as smoothly as it should, send for a can of "No. 205," and you'll save a heap of time, worry and trouble.

Send for our booklet "About Graphite Lubrication."

1 lb. Patent Friction Top Cans (30 cans in case)	Per can,	$0 20
5 lb. Screw Top Tin Cans (12 cans in case)	"	90
10 lb. Screw Top Tin Cans (6 cans in case)	"	1 65
25 Strawboard Boxes (2 boxes in case)	Per box,	3 00
Kegs (about 100 lbs.)	Per lb.,	10
Barrels (about 325 lbs.)	"	9

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MEXICAN GRAPHITE PAINT



Made in Four Colors:
Color A—Natural Color. Color C—Jet Black.
Color B—Dark Green. Color D—Dark Brown.
SEND FOR COLOR CARD.

Graphite, technically speaking, is one of the natural forms of carbon.

It is highly refractory, absolutely inert and, *when pure*, impervious to any known exposure—that is to say it is unaffected by smoke, water, brine, acids, alkali, extreme temperatures, steam, moisture, sulphur fumes, or, in fact, by any chemical or climatic condition.

The result is a paint unequaled for durability—a paint that, owing to its large covering power and reasonable price, costs less than other good paints—*a paint that is inexpensive but not "cheap"*—just the thing for Structural Iron and Steel, Steam Pipes, Coils, Roofs, Smoke Stacks, Boiler-fronts, Gas Holders, Vessels, Fences, Freight Cars, Water Tanks, Bridges, Grain Elevators, Trolley Poles, etc., etc.

It is conceded that the outlay for labor—*the cost of applying paint*—is a greater item than the cost of the paint itself.

Use a *durable* paint and thus postpone for the longest time possible the expensive necessity of repainting.

HOW TO ESTIMATE QUANTITY NEEDED

To estimate quantity U. S. G. Co.'s Mexican Graphite Paint necessary for any given job, take accurate measurements and compute area to be painted, adding ten (10) per cent for waste of paint, complexity of architecture, etc., and use following table, which is based on actual tests made under average weather conditions and by a painter of average skill, our directions as to mixing and applying being carefully followed.

APPROXIMATE QUANTITY REQUIRED PER 1,000 SQ. FEET (TEN SQUARES)

Kind of Surface	Liquid		Semi-Paste		Paste	
	One Coat	Two C'ts	One Coat	Two C'ts	One Coat	Two C'ts
Dressed lumber or old painted wood	2½ gals.	4 gals.	1¼ gals.	2 gals.	8 lbs.	12½ lbs.
Rough, scaly or rusty metal surface	1⅓ "	2⅔ "	⅔ "	1⅛ "	4¼ "	7½ "
Smooth or new metal surface	1 "	2 "	½ "	1 "	3⅛ "	6¼ "

And other surfaces, wood or metal, in proportion according to condition.

PASTE FORM

To make one gallon liquid paint, mix 3⅛ lbs. paste with ¼ gallon boiled linseed oil.

5 lb. Tin Pails (20 in case)	$0 15 per lb.
12½ lb. Tin Pails (8 in case)	14 " "
25 lb. Tin Pails (4 in case)	13½ " "
125 lb. Kegs	13 " "
One-half barrels (about 350 lbs.)	12¼ " "
Barrels (about 600 lbs.)	12 " "

SEMI-PASTE

To make ready-for-use paint, mix one gallon semi-paste with 1½ gals. boiled linseed oil.

5 gal. Kits	$1 55 per gal.
10 gal. Kits	1 50 " "
One-half barrels (about 30 gals.)	1 40 " "
Barrels (about 52 gals.)	1 35 " "

LIQUID, READY-FOR-USE

½ gal. Tin Pails (12 in case)	$1 60 per gal.
1 gal. Tin Pails (6 in case)	1 55 " "
5 gal. Kits	1 45 " "
10 gal. Kits	1 40 " "
One-half barrels (about 30 gals.)	1 30 " "
Barrels (about 52 gals.)	1 25 " "

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MEXICAN GRAPHITE CUP GREASE



Lubrication is the minimization of friction.

And friction—the result of contact between two moving surfaces—is induced by the presence of those irregularities or inequalities of microscopical minuteness which occur even in such carefully finished bearings as appear perfectly smooth to the naked eye.

Friction may be overcome to a certain extent by the use of lubricating oils or greases the latter being a combination of the former for properly made greases are really solidified oils.

Oil alone, however, will relieve friction only in so far as it provides, one might say, a sort of cooling bath in which the bearing runs.

Far better results are secured by the use of grease—solidified oil—carrying sufficient lubricating matter of such a nature as to fill in and even up the minute inequalities above mentioned.

And no other lubricating material is as effective for this purpose as is Graphite—*provided it be Graphite of the right sort.*

For not only does Graphite accomplish this evening up process but it is an absolutely inert substance unaffected by high temperatures..

Our Cup Greases are a combination of proper mineral oils with our best quality of pure, soft, air-floated Lubricating Graphite—not "Flake" Graphite but *Powdered* Graphite of impalpable fineness. *Absolutely Free From Grit* and of such a peculiarly adhesive nature as to cause it to "stay put"—something that "Flake" Graphite will *not* do—on that part of the bearing with which it comes in contact.

The result is that there is soon formed an infinitely thin mirror-like graphite film which, offering minimum resistance to surfaces in contact. reduces friction accordingly.

U. S. G. Co.'s Mexican Graphite Cup Greases may be used freely on the finest bearings and will be found to wear longer and afford better lubrication than other greases and with less attention.

Made in four consistencies (or densities) as follows:

Extra Soft—This is about as soft as non-fluid oil and is suited to very rapid running machinery or machinery so constructed that the parts to be lubricated must be reached by means of a tube or common squirt can. Best ever for transmissions and sliding gears when same are enclosed in a case.

Soft—Considerably harder than "Extra Soft" and intended for general use on crank pins, cross-heads, valve motions, eccentrics, slides, pillow-blocks, main journals, etc., where a spring or compression cup is used on common bearings where aperture is small.

Medium—A little harder than "Soft" and has a somewhat higher melting point. Adapted to use in screw cups or in compression cups having extra strong spring. Can also be used on open bearings where aperture is moderately large.

Hard—A good stiff consistency for heavy open bearings and places where a high melting point is essential. Can be used in screw cups. Especially suited to upright shafting, cams, spindles, etc., etc

1 lb. Friction Top Tin Cans (36 in case)	Per can,	$0 25
5 lb. Friction Top Tin Pails (12 in case)	" pail,	1 10
10 lb. Friction Top Tin Pails (6 in case)	" "	1 90
25 lb. Tin Cans (2 in case)	" can,	4 50
Kegs (about 140 lbs.)	" lb.,	17
One-half Barrels (about 300 lbs.)	" "	16
Barrels (about 500 lbs.)	" "	15

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MEXICAN GRAPHITE CABLE GREASE



Mexican Graphite has a natural affinity to metals and after a short period of continuous application the Graphite contained in this dressing will impart to wire ropes or cables a smooth, slippery, waterproof surface thereby accomplishing a very appreciable saving in power, noticeably reducing wear and tear and absolutely preventing "cutting" or corrosion.

May be applied by means of "swab" or otherwise.

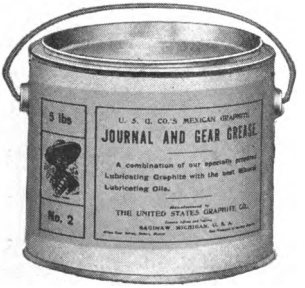
Adhesive in the highest degree, it is not removed by rain or running water—it "stays put."

So its use minimizes the cost of properly lubricating and caring for wire ropes and cables.

Packaged and sold as follows;

5 lb. Tin Pails (12 in case)	Per pail,	$0 90
10 lb. Tin Pails (6 in case)	" "	1 50
25 lb. Wood Pails	" "	3 00
Kegs (about 140 lbs.)	Per lb.	10
One-half Barrels (about 250 lbs)	" "	9½
Barrels (about 500 lbs.)	" "	9

MEXICAN GRAPHITE JOURNAL AND GEAR GREASE



For the lubrication of journals, gears, etc.

Made in three consistences—No. 1 or Hard; No. 2 or Medium, No. 3 or Soft.

Good in any climate.

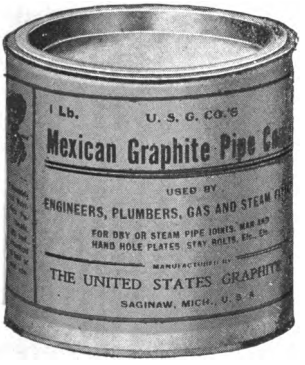
And particularly adapted to street railway uses.

Packaged and sold as follows;

5 lb. Tin Pails (12 in case)	Per pail,	$0 90
10 lb. Tin Pails (6 in case)	" "	1 50
25 lb. Wood Pails	" "	3 00
Kegs (about 140 lbs.)	Per lb.	10
One-half Barrels (about 300 lbs.)	" "	9½
Barrels (about 500 lbs.)	" "	9

MEXICAN GRAPHITE PIPE CEMENT

USED BY ENGINEERS, PLUMBERS, GAS AND STEAM FITTERS FOR DRY OR STEAM PIPE JOINTS, GASKETS, MAN AND HAND HOLE PLATES, STAY BOLTS, ETC.



A compound suited to all kinds of joints, having for its base our pure Mexican Graphite which is wholly unaffected by water, heat, cold or chemical action of any nature, and is in itself a perfect lubricant, as such assisting the pipe fitter to a permanent and absolutely air and water-tight joint, that, whether underground or in buildings, can be unscrewed as easily ten years hence as the day it was made without the slightest injury to threads or tools for, unlike red lead, it never sets hard. Applied with hand, brush or putty knife. Prevents rust. Expands and contracts with temperature. Adhesive. And because of its greater bulk, pound for pound, compared with other compounds, a pound will go further and accomplish more than will an equal weight of other preparations, making it by far the most economical.

Packaged and sold as follows:

1 lb. Tin Cans (36 in case) (Detachable air-tight covers.)	Per can,	$0 20
5 lb. Tin Pails (20 in case)	Per lb.	18
12½ lb. Tin Pails (8 in case)	" "	16
25 lb. Tin Pails (4 in case)	" "	15
100 lb. Tin Cans (1 in case)	" "	14

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MEXICAN PLUMBAGO AXLE GREASE



Compounded from lubricating oils of the best quality and containing just the right proportion of our Air-Floated Lubricating Graphite. It is not only "built to wear," but will unfailingly afford effective lubrication under all conditions.



Mexican Plumbago Axle Grease is absolutely free from grit, will not gum, harden, dry up or shrink, nor will it "fry out" of hubs or boxes in the hottest weather or freeze with a low temperature.

Suitable for heaviest truck or finest carriage, and usable in any climate.

Most satisfactory and economical axle grease in the world for brewers, liverymen, trucking companies, coal and ice dealers, etc., etc.

A good, fair way to judge an axle grease is to use different greases on the two sides of your vehicle, noting which wears the longer with best results, and we invite this sort of a comparison of our Mexican Plumbago Axle Grease with whatever grease you may be using.

1 lb. strawboard boxes (4 dozen in case)	Per case,		$3 00
Same	"	gross,	8 50
1 lb. tin boxes (3 dozen in case)	"	case,	2 40
Same	"	gross,	9 00
3½ lb. tin boxes (2 dozen in case)	"	dozen,	2 25
7½ lb. tin boxes (1 dozen in case)	"	"	4 50
12½ lb. wood pails (4 pails in crate)	"	"	6 50
25 lb. wood pails	"	"	12 00

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RED SHEET PACKING



U. S. Red Sheet Packing is especially adapted for high-pressure work and is not injuriously affected by any degree of steam heat, nor will it blow out under the highest pressure. It retains its elasticity unimpaired in service. A high-grade packing for ammonia, liquors, alkalies, air, or hot or cold water, and and is not affected by them.

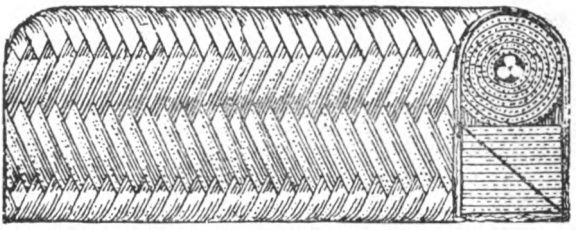
Price, per pound $1 00

USUDURIAN SHEET PACKING, all sizes	Per pound,	$1 00
BLACK HAWK SHEET PACKING, all sizes	"	1 00
SHEET RUBBER, C. I. or C. B. S.	"	50

Send for complete catalogue on rubber goods.

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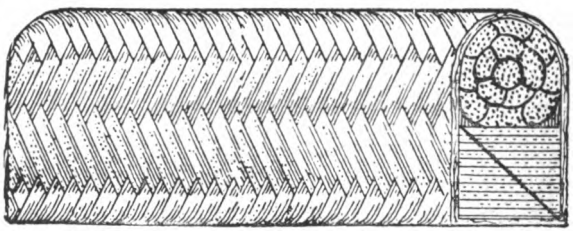
HIGH PRESSURE PISTON PACKING



U. S. brand of High Pressure Piston Packing is made to meet all the requirements of high pressure work. Each strand of the core is lubricated separately before braided and it will not harden or crack under any degree of heat. For hard service and wearing qualities, this packing is unequalled.

Price.....Per lb. $1 25

DIAGONAL PISTON PACKING

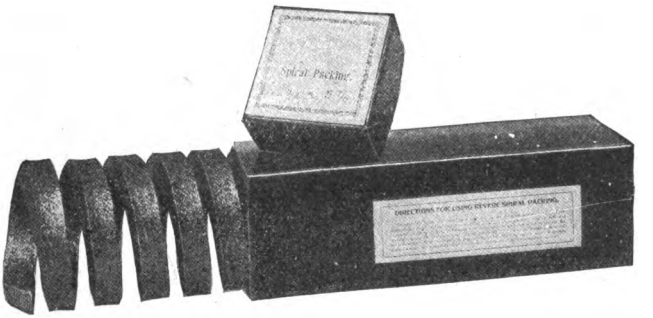


U. S. brand Diagonal Piston Packing is made of square flax in combination with a fine grade of Tuck's, braided together. A substantial packing in every respect for regular steam pressures and service.

Price.....Per lb. $1 00

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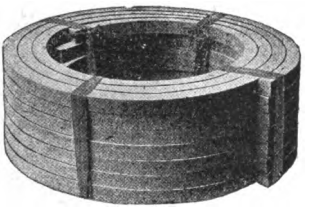
U. S. SPIRAL SQUARE PACKING



Made in 12-foot lengths. Each box contains one coil. We furnish only full boxes. All sizes in stock.

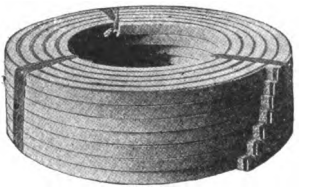
Price.....Per pound, $1 25

U. S. FINE SQUARE DUCK PUMP PACKING



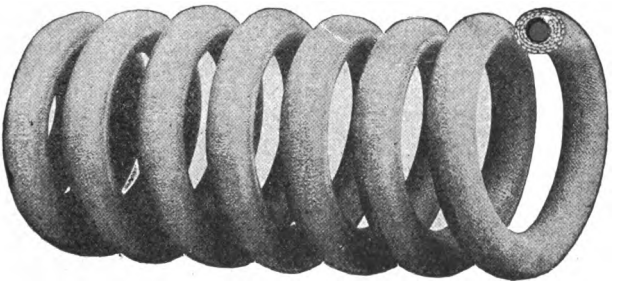
Price.....Per pound, $0 85

U. S. FINE SQUARE DUCK RUBBER BACK HYDRAULIC PACKING



Price.....Per pound, $0 85

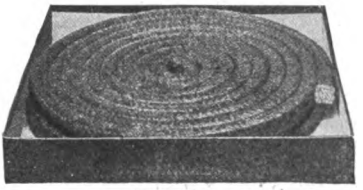
U. S. RED CORE PISTON PACKING



U. S. Brand Red Core Piston Packing is a round expansion packing made in spiral form with a red rubber core. The core is made from a compound that will not harden under any degree of heat. The outside is lubricated with a fine grade of plumbago. It will tightly pack any rod, however badly scored or corroded. Will hold under 400 pounds of steam.

Price.....Per pound, $1 25

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U. S. BRAND SQUARE FLAX PACKING

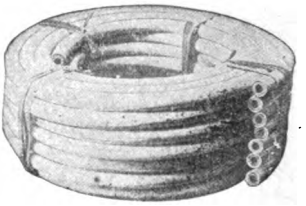
Price Per lb. $0 50

SQUARE HEMP PACKING

Price Per lb. $0 50

U. S. GUM CORE PACKING

Price.....Per lb. $0 75



U. S. RING PACKING

Rod Packing



Expansion Ring



Made either single or double. Are from same stock as U. S. Special Packing. Cut to exact sizes as specified. Double rings can be cut only in the larger sizes.
Price.....Per lb. $1 50

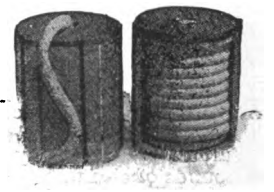
ASBESTOS WICK PACKING



Made of the purest asbestos fibre, absolutely acid and fireproof, and is used for packing small steam pumps, tubes, valve stems and similar purposes. It is put up in ¼, ½ and 1 pound balls.
Price.....Per lb. $0 50

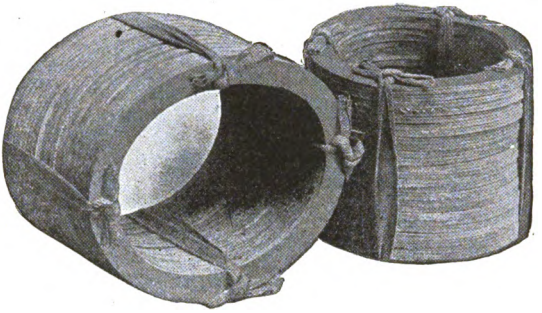
ASBESTOS ROPE PACKING

Our Standard Rope Packing is made of long asbestos fibre, is absolutely acid and fireproof, and is not affected by oils. It is extensively used for packing engines, pumps, joints and similar purposes. It is furnished on reels of from 10 to 25 lbs., in regular sizes, from ¼ inch to 2½ inches in diameter. Price.....Per lb. $0 50



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HANDHOLE AND MANHOLE GASKETS



These gaskets are made of pure rubber, or with cloth or wire insertion. We can furnish any style or shape required on short notice. We can furnish moulded gaskets in the standard sizes without additional cost, and special sizes on short notice when ordered in sufficient quantities to warrant making moulds.

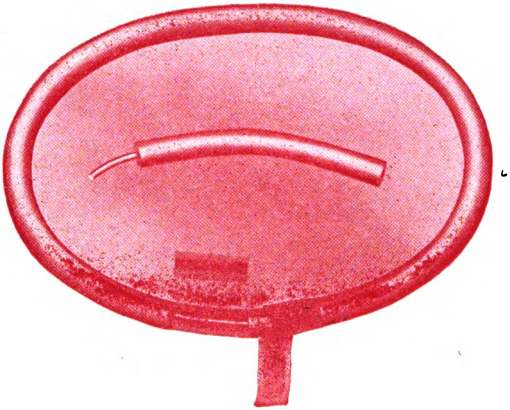
In ordering gaskets, send template when possible; otherwise give inside measurements and width of flange and thickness desired.

Price Per pound, $1 00

ASBESTOS OR KEARSARGE GASKETS " 2 00

U. S. RED CRESCENT TUBING

FOR GASKETS



Possesses all the merits that a high grade of material and best of workmanship can produce. Will not blow out.

Price Per pound, $1 00

BLACK HAWK TUBING, for gaskets (red inside with black semi-vulcanized cover) Per pound, 1 00

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RUBBER HOSE

WATER HOSE

"HARLEM BRAND"



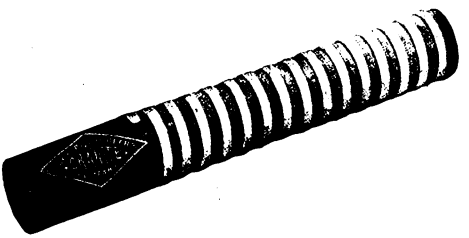
A thoroughly reliable article. Prices on opposite page.

STEAM HOSE



Prices on opposite page.

WIRE WOUND HOSE



Wound With Flat Wire

We can furnish water or steam hose wound with flat, oval or round wire. Also marline.

Send for complete rubber catalogue.

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RUBBER HOSE

LIST PRICES ON WATER HOSE

Internal Diameter	2-Ply Per Foot	3-Ply Per Foot	4-Ply Per Foot	5-Ply Per Foot	6-Ply Per Foot
½ inch	$0 20	$0 25	$0 30	$0 37	$0 45
¾ "	25	30	37	46	55
1 "	33	40	50	62	75
1¼ "	42	50	62	77	93
1½ "	50	60	75	93	1 12
1¾ "	58	70	87	1 08	1 30
2 "	66	80	1 00	1 25	1 50
2¼ "	75	90	1 12	1 40	1 68
2½ "	83	1 00	1 25	1 56	1 87
2¾ "	92	1 10	1 37	1 71	2 05
3 "	99	1 20	1 50	1 87	2 25

LIST PRICES ON STEAM HOSE

Internal Diameter	3-Ply Per Foot	4-Ply Per Foot	5-Ply Per Foot	6-Ply Per Foot	7-Ply Per Foot	8-Ply Per Foot
½ inch	$0 43	$0 51	$0 63	$0 76	$0 89	$1 02
¾ "	51	67	83	1 00	1 17	1 34
1 "	67	83	1 03	1 24	1 45	1 66
1¼ "	85	1 04	1 30	1 56	1 82	2 08
1½ "	1 02	1 25	1 56	1 87	2 18	2 50
1¾ "	1 18	1 45	1 81	2 17	2 53	2 90
2 "	1 34	1 66	2 07	2 49	2 90	3 32
2¼ "	1 50	1 87	2 33	2 80	3 27	3 74
2½ "	1 66	2 08	2 60	3 12	3 64	4 16

LIST PRICES FOR WINDING

With Marline or "S.A.P.," either Round or Flat Wire.

Size	3-Ply Per Foot	4-Ply Per Foot	5-Ply Per Foot	6-Ply Per Foot
½ inch	$0 09	$0 10	$0 11	$0 12
¾ "	11	12	13	14
1 "	13	14	15	16
1¼ "	15	16	17	18
1½ "	18	19	20	21
1¾ "	20	21	22	23
2 "	23	24	25	26
2¼ "	25	26	27	28
2½ "	27	28	29	30

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RUBBER-LINED MILL HOSE



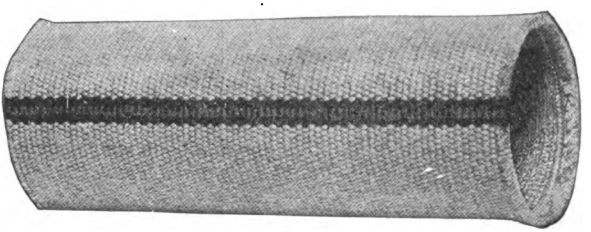
OUR BRANDS:

"BURRO" "LITTLE GIANT" "GINGO"

LIST PRICES

Size	Per Foot	Size	Per Foot	Size	Per Foot
1 inch	$0 35	2 inch	$0 60	3 inch	$1 00
1¼ inch	45	2¼ inch	65	3½ inch	1 50
1½ inch	50	2½ inch	70	4 inch	2 00

LINEN UNLINED MILL HOSE



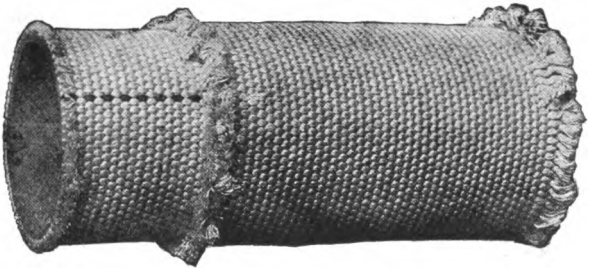
We furnish two grades of unlined Linen Hose: REVERE UNDERWRITERS' and TRIDENT. Revere Underwriters' and Trident brands conform to the requirements of the Associated Factory Mutual Fire Insurance Companies.

Send for complete catalogue of Mill Hose.

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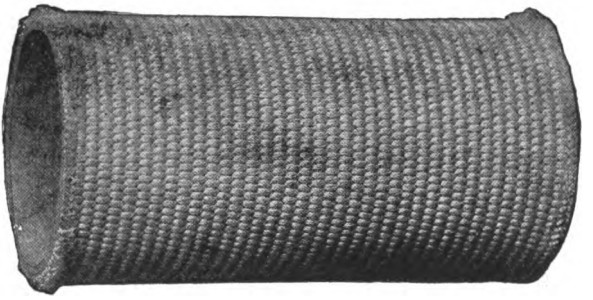
COTTON RUBBER-LINED HOSE
FOR FIRE DEPARTMENTS

JACKET—WOVEN



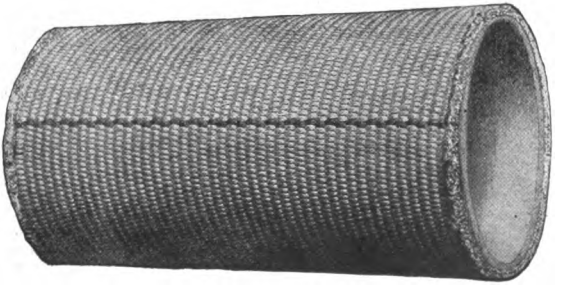
Emperor Jacket, Mastiff Jacket, Beacon Jacket, Ulysses Jacket.

SINGLE—WOVEN



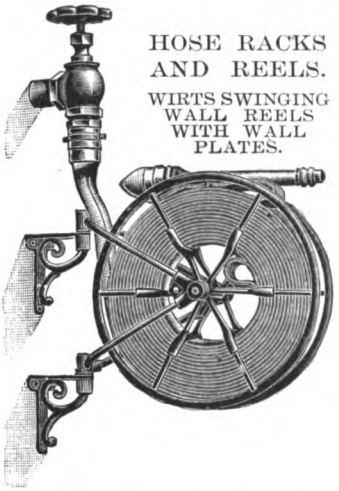
Samson Single and Matchless Single.

UNDERWRITERS' HOSE
SECURITY BRAND



Prices on application.

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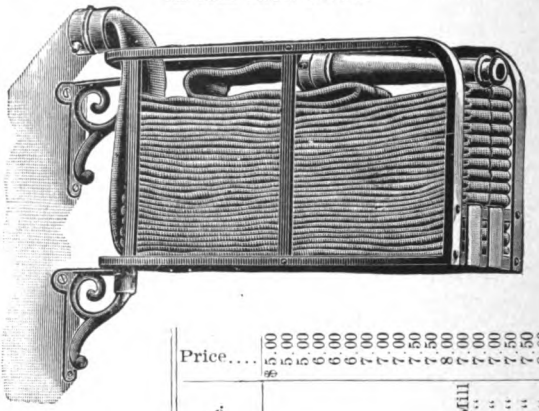


HOSE RACKS AND REELS.

WIRTS SWINGING WALL REELS WITH WALL PLATES.

No.	Capacity	Size Hose	Description of Hose	Price
0	50 ft.	1¼in. or 1½in.	Unlined Linen	$ 6.00
00	50 ft.	2 in.	" "	6.00
000	50 ft.	2½ in.	" "	6.00
0½	75 ft.	1¼in. or 1½in.	" "	6.00
00½	75 ft.	2 in.	" "	6.00
000½	75 ft.	2½ in.	" "	6.00
1	100 ft.	1¼in. or 1½in.	" "	6.00
2½	1 0 ft.	2 in.	" "	6.00
3½	100 ft.	2½ in.	" "	6.00
2	150 ft.	1¼in. or 1½in.	" "	6.00
3	150 ft.	2 in.	" "	6.00
4	150 ft.	2½ in.	" "	6.50
5½	200 ft.	1¼in. or 1½in.	" "	7.00
6½	200 ft.	2 in.	" "	7.50
7½	200 ft.	2½ in.	" "	8.00
7	300 ft.	2½ in.	" "	8.50
8	400 ft.	2½ in.	" "	11.50
2	50 ft.	1¼in. or 1½in.	Cotton Rubber-lined	6.00
3	50 ft.	2 in.	" "	6.00
4	50 ft.	2½ in.	" "	6.50
5	100 ft.	1¼in. or 1½in.	" "	7.50
6	100 ft.	2 in.	" "	8.00
7	100 ft.	2½ in.	" "	8.50
8	150 ft.	2½ in.	" "	11.50

ANGLE IRON RACK.

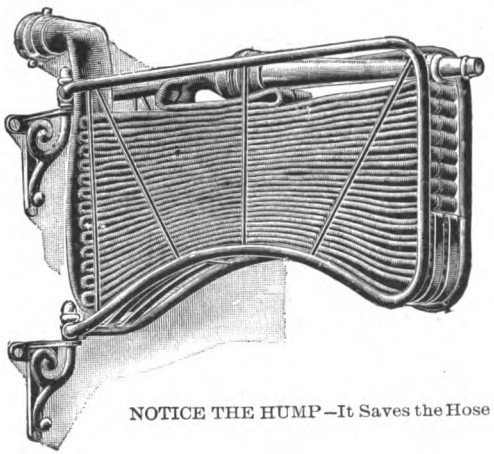


Angle Iron Racks, Nos. 70, 71 and 72; also Hump Racks, Nos. A0, A0X and A00 can be furnished to hold 75 ft. of hose, adding 50 cents to list price. When ordering racks with pipe clamps, be sure to give the size of pipe they are to fit. Brackets furnished unless pipe clamps are specified.

PRICE LIST OF "HUMP" AND "ANGLE IRON" RACKS.

We can supply any of the following sizes finished in nickel or copper plate at an additional cost of $2.00 each net.

HUMP RACK.



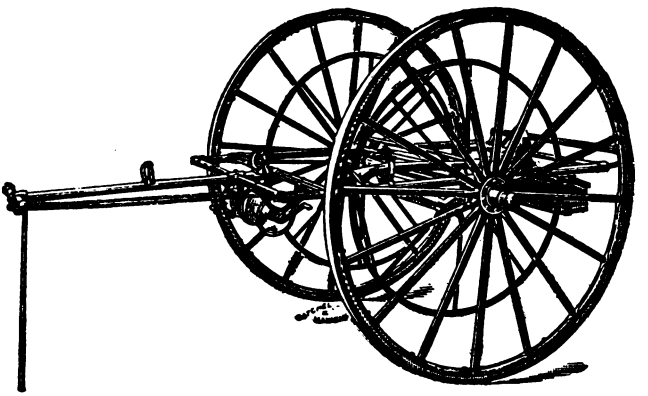
NOTICE THE HUMP—It Saves the Hose

Angle Iron Rack Numb'r	Hump Rack Number	Capacity	Size Hose	Description of Hose	Price
70	A0	50 ft.	1¼in. or 1½in.	Unlined Linen	$ 5.00
71	A0X	50 ft.	2 in.	" "	5.00
72	A00	50 ft.	2½ in.	" "	6.00
73	A1	100 ft.	1¼in. or 1½in.	" "	6.00
74	A1X	100 ft.	2 in.	" "	6.00
75	A2	100 ft.	2½ in.	" "	6.00
76	A3	150 ft.	1¼in. or 1½in.	" "	7.00
77	A3X	150 ft.	2 in.	" "	7.00
78	A4	150 ft.	2½ in.	" "	7.00
79	A5	200 ft.	1¼in. or 1½in.	" "	7.50
80	A5X	200 ft.	2 in.	" "	7.50
81	A6	200 ft.	2½ in.	" "	8.00
76	A3	50 ft.	1¼in. or 1½in.	Cotton Rubber-lined Mill	7.00
77	A3X	50 ft.	2 in.	" "	7.00
78	A4	50 ft.	2½ in.	" "	7.00
79	A5	100 ft.	1¼in. or 1½in.	" "	7.50
80	A5X	100 ft.	2 in.	" "	7.50
81	A6	100 ft.	2½ in.	" "	8.00

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STYLE M—VILLAGE HOSE CARTS.

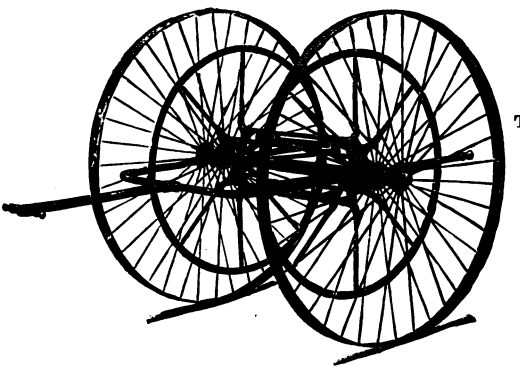
Medium weight, very strong, and will endure extremely rough usage. They are mounted on wood wheels of the very best pattern; have tool box and friction roller at rear, rope reel and drag rope, nozzle holder on tongue and tongue rest. Equipped with fireman's axe and crow-bar in spring holders. Hub caps are polished brass or nickel plated, if desired. Handsomely finished in vermilion and black. For Roller Bearings, add $35 to List Prices.



Number of Carts	419	420	421
Height of wheels	4 ft. 6 in.	5 ft.	5 ft. 6 in.
Extreme outer width	5 ft.	5 ft.	5 ft. 4 in.
Extreme length	8 ft.	8 ft. 8 in	9 ft. 6 in.
Weight complete	325 lbs.	400 lbs.	500 lbs.
Capacity, 2½-inch Double Jacket Fire Hose	350 ft.	400 ft.	500 ft.
Price	$120 00	$130 00	$160 00

STYLE F.
KNOX CART.

For Railroads, Mills, Factories and Warehouses.



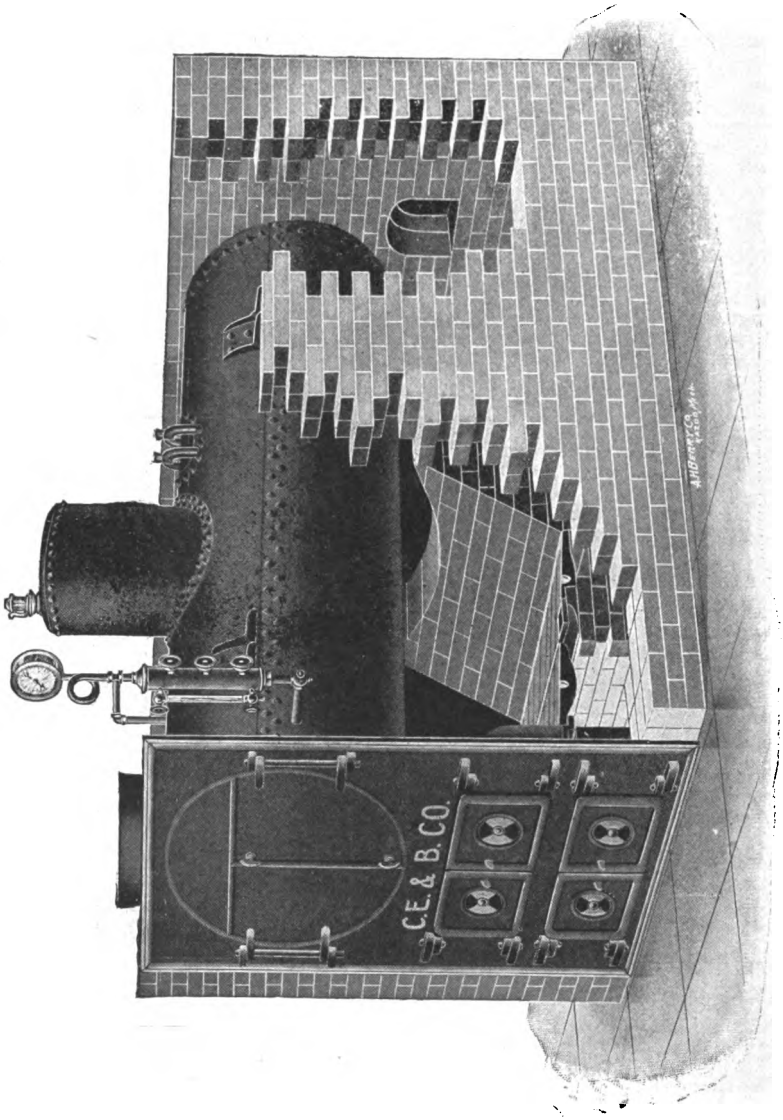
Tubular Iron Frame and Steel Wheels. Very Strong. Handsomely Finished in Vermilion and Black.

	Style F.			Style H.		
Number of Cart	101	102	103	107	108	109
Height of Wheels in inches	42	48	52	42	48	52
Extreme outside width in inches	42	48	53	42	48	53
Weight in pounds	140	180	220	160	200	250
Capacity of 1½-inch 4-ply Rubber Hose	300 ft.	500 ft.	600 ft.	300 ft.	500 ft.	600 ft.
" " 2 -inch " " "	200 ft.	400 ft.	500 ft.	200 ft.	400 ft.	500 ft.
" " 2½-inch " " "	150 ft.	300 ft.	400 ft.	150 ft.	300 ft.	400 ft.
" " 1½-inch Cotton Rubber-lined Hose	600 ft.	800 ft.	1000 ft.	600 ft.	800 ft.	1000 ft.
" " 2 -inch " " "	400 ft.	650 ft.	850 ft.	400 ft.	650 ft.	850 ft.
" " 2½-inch " " "	300 ft.	500 ft.	700 ft.	300 ft.	500 ft.	700 ft.
Price	$35 00	$45 00	$55 00	$50 00	$60 00	$70 00

The Style H has Tool Box, Nozzle Holder, Axe Rack and Friction Roller.

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HORIZONTAL BOILER WITH FULL FRONT

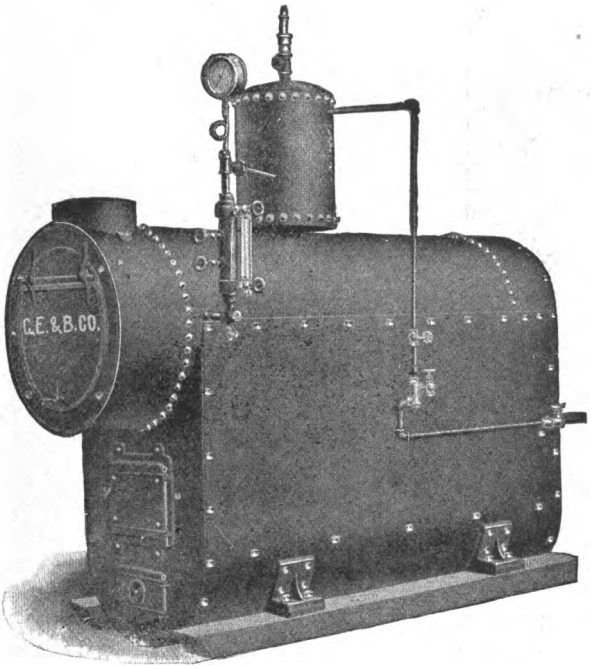


Full Flush Front, with smoke doors opening to right and left. This style front is used on boilers 42 and 44 inches in diameter. Boilers less than 36 inches in diameter are furnished with single doors.

Prices and specifications sent upon application.

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"CHAMPION" ECONOMIC BOILER



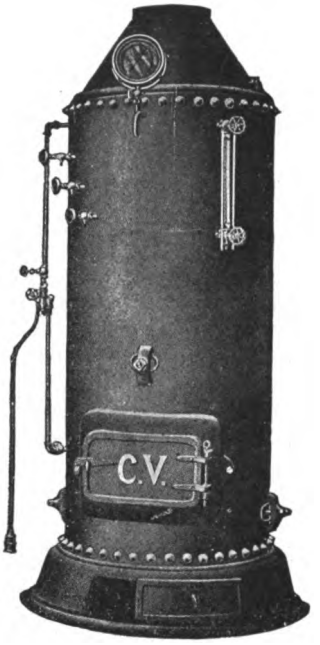
Fire box lined with fire brick. Mounted on skids. Made of flange steel of 60,000 lbs. tensile strength. Tested to 150 lbs. hydrostatic pressure. A perfect boiler.

Horse power rating	4	5	6	7	8	10	12	15	20	25
Diameter of shell, inches	26	26	26	30	30	30	30	30	34	34
Thickness of shell, inches	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
Thickness of heads, inches	5-16	5-16	5-16	5-16	5-16	5-16	5-16	5-16	5-16	5-16
Length of tubes, feet	3	4	5	5	6	7	8	10	10	12
Number of 3-inch tubes	15	15	15	22	22	22	22	22	26	30
Length of grates, inches	24	24	24	24	30	30	30	36	36	40
Width of grates, inches	20	20	20	24	24	24	24	24	28	28
Size of blow-off valve, inches	¾	¾	1	1	1	1	1	1	1¼	1¼
Size of safety valve, inches	¾	¾	¾	1	1	1	1¼	1½	1½	1½
Length of stack, feet	20	20	20	24	24	24	24	24	24	26
Diameter of stack, inches	12	12	12	14	14	14	14	14	16	16
Approximate weight, complete	2,400	2,800	3,300	3,700	4,200	4,700	5,300	6,000	7,000	7,500

We furnish the following fixtures and fittings: Smoke Box Extension, Door and Stack Saddle, Grate Bars, Bearing Bars, Bridge Wall, Fire Brick Lining, Safety Valve, Steam Gauge and Siphon, Water Column with Glass Water Gauge, two Gauge Cocks, Feed Check and Blow-off Valves, Injector fitted to Boiler, Smoke Stack and Guys four times length of stack. The Detachable Dome enables convenient loading in box cars, as well as economy in freight charges. Anything else ordered will be charged for.

Send for boiler catalogue.

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PLAIN VERTICAL BOILER

CAST FIXTURES: Base, Hood, Fire Door, Ash Pit Door and Grates.

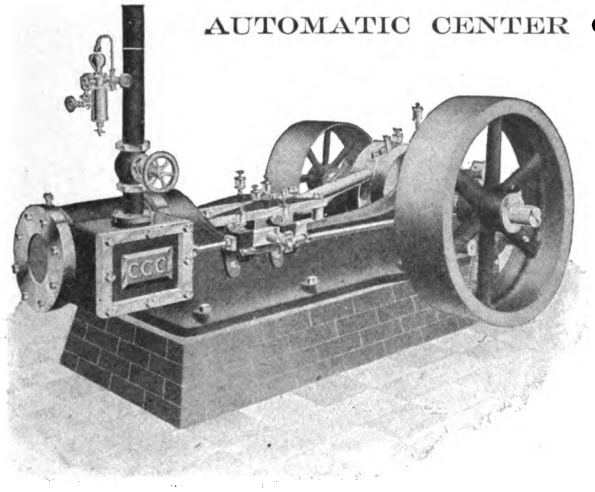
TRIMMINGS: Injector fitted, Steam Gauge, Water Gauge, Gauge Cocks, Pop Safety Valve, Blow-off, Check and Stop Valves.

All boilers above 26 inches in diameter have vertical seams, double riveted. They are made of flange steel, 60,000 pounds tensile strength, and are tested to 150 pounds hydrostatic pressure.

Horse Power.....	1¾	2	3	4	5	6	8	12	16	20
Diameter of Boiler, inches.....	20	20	20	24	24	26	30	36	36	42
Height above base, inches.....	36	43	50	50	60	60	60	72	96	96
Diameter of furnace, inches.....	16	16	16	20	20	22	26	31	31	37
Height of furnace, inches.....	18	18	18	18	22	22	24	26	32	32
Size of safety valve, inches.....	¾	¾	¾	¾	¾	¾	1	1¼	1½	1½
Size of blow off, inches.....	¾	¾	¾	¾	¾	¾	¾	1	1	1
Thickness of steel in shell, inches.....	5/16	¼	¼	¼	¼	¼	¼	¼	¼	¼
Thickness of steel in heads, inches.....	¼	5/16	5/16	5/16	5/16	5/16	5/16	⅜	⅜	7/16
Thickness of steel in fire-box, inches...	¼	¼	¼	¼	¼	¼	¼	5/16	5/16	5/16
Length of tubes, inches.....	18	25	32	32	38	38	36	48	64	64
Number of 2-inch tubes	19	19	19	31	31	37	43	55	55	79
Wt. of boiler, without trimmings or fixtures.....	325	430	530	640	750	840	1,010	1,520	2,280	3,000
Weight of boiler complete	475	560	620	890	1,060	1,300	1,550	2,350	3,000	4,000
Outside diameter of stack opening, inches.....	8	8	8	10	10	10	10	16	16	20
Height, floor to top of hood, inches...	50	54	60	66	76	76	76	98	120	120

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AUTOMATIC CENTER CRANK ENGINE

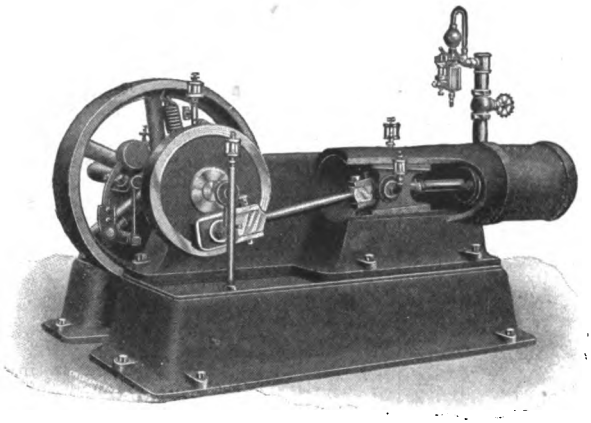
The speed of this engine can be regulated either by altering the tension of the spring or by changing the position of the weights on the weight levers. Increasing the tension to increase the speed and decreasing it to run engine slower, or moving the weights nearer the fulcrum to increase the speed and nearer the end of the levers to reduce it. Moving the weights is always to be preferred where it is possible. *Care* must be taken to keep the *valve* and *cylinder perfectly lubricated*, for if the valve is allowed to run dry it interferes with the smooth action of the governor. This engine has Balance Valve.

DIMENSIONS OF AUTOMATIC CENTER CRANK ENGINES. BASED ON 80 POUNDS INITIAL PRESSURE

No.	Horse Power	Cylinder		Shaft	Balance Wheel		Pulley		Pipes		Rev. per Min.	Weight.	Weight with Sub-Base	Floor Space	
		Diameter	Stroke		Diam.	Face	Diameter	Face	Steam	Exhaust				Length Inches	Width Inches
00	5	4	5	1½	20	6	12	4½	¾	1	370	625	775	42	30
0	6	4½	5	1½	20	6	12	4½	¾	1	370	675	825	42	30
1	7	5	6½	2	20	6	14	6½	1	1¼	300	750	975	52	36
2	8	5½	6½	2	20	6	14	6½	1	1¼	275	875	1,100	52	36
3	10	6	8	2½	30	6¾	16	6½	1¼	1½	260	1,100	1,425	64	42
3½	12	6½	8	2½	30	6¾	16	6½	1¼	1½	260	1,200	1,525	64	42
4	15	7	8	2½	30	6¾	18	8	1½	2	260	1,350	1,675	64	42
4½	18	7½	8	2½	30	6¾	18	8	1½	2	260	1,450	1,775	64	42
5	20	7½	10	3⅛	35	6¾	20	10	1½	2	260	1,550	2,100	81	48
6	25	8	10	3⅛	35	6¾	20	10	2	2½	265	1,750	2,350	81	48
6¼	30	8½	10	3⅛	35	6¾	20	10	2	2½	265	2,100	2,750	81	48
6½	35	9½	10	3⅛	35	6¾	24	12	2½	3	260	2,400	3,050	81	48
7	40	9½	12	3⅝	40	10½	24	12	2½	3	250	3,200	4,000	97	60
8	45	10	12	3⅝	40	10½	24	12	2½	3½	250	3,500	4,300	97	60
8½	50	11	12	3⅝	40	10½	26	14	2½	3½	250	3,800	4,700	97	60
9½	55	10½	14	4⅛	48	13	28	14	2½	3½	250	4,400	5,900	116	74
10	60	11	14	4⅛	48	13	28	14	3	4	250	4,600	6,100	116	74
10½	65	11½	14	4⅛	48	13	28	14	3	4	250	4,800	6,300	116	74
11	70	12	14	4⅝	48	13	30	14	3	4	250	5,000	6,500	116	74
11½	75	12½	14	4⅝	48	13	30	14	3	4	250	5,400	6,900	116	74
12	80	12	16	4⅝	54	15	30	16	3	4	225	5,700	7,700	133	79
12½	85	12½	16	4⅝	54	15	34	16	3	4	225	6,100	8,100	133	79
13	95	13	16	5¼	54	15	34	16	3½	4½	225	6,500	8,500	133	79
14	110	14	16	5¼	60	16	34	16	3½	4½	225	7,100	9,100	133	79
15	118	14½	16	5¼	60	16	36	16	3½	4½	225	7,400	9,400	133	79
16	125	15	16	5¼	60	16	36	16	4	5	225	7,700	9,700	133	79

Send for engine catalogue.

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AUTOMATIC SIDE CRANK ENGINE

WITH THROTTLING GOVERNOR

Trimmings:—A complete set of nickel plated glass oilers, sight feed lubricator, throttle valve and two cylinder cocks.

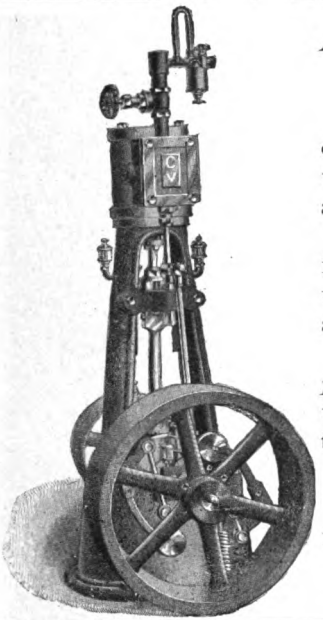
This engine is of the single slide valve type, with overhanging cylinder and locomotive guides.

In every point the design is such as to make it free from parts liable to derangement through attempts at adjustment by unskilled engineers, while everything that would effect its regulation, economy or smooth running qualities has been carefully considered.

DIMENSIONS OF CENTER CRANK ENGINES, BASED ON 80 POUNDS INITIAL PRESSURE

No.	Horse Power	Cylinder		Diam. Shaft	Balance Wheel		Pulley		Pipes		Revolutions Per Minute	Weight	Weight with Sub-Base	Floor Space Over All	
		Diameter	Stroke		Diam.	Face	Diameter	Face	Steam	Exhaust				L'ngth Inches	Width Inches
00	4	4	5	1½	17	4½	12	4½	¾	1	325	625	775	42	30
0	5	4½	5	1½	17	4½	12	4½	¾	1	325	675	825	42	30
1	6	5	6½	2	20	6	14	6½	1	1¼	250	750	975	52	36
2	7	5½	6½	2	24	6	14	6½	1	1¼	250	875	1100	52	36
3	8	6	8	2½	24	6	16	6½	1¼	1½	200	1100	1425	64	42
3½	9	6½	8	2½	24	6	16	6½	1¼	1½	200	1200	1525	64	42
4	10	7	8	2½	26	6¾	16	6½	1½	2	200	1350	1675	64	42
4½	12	8	8	2½	30	6¾	18	8	1½	2	175	1450	1775	64	42
5	15	7½	10	3⅛	30	6¾	20	8	1½	2	175	1550	2100	81	48
6	18	8	10	3⅛	30	6¾	20	10	2	2½	175	1750	2350	81	48
6½	20	9½	10	3⅛	35	6¾	24	10	2½	3	165	2400	3050	81	48
7	25	9½	12	3⅝	40	10½	24	10	2½	3	165	3200	4000	97	60
8	30	10	12	3⅝	40	10½	24	12	2½	3½	165	3500	4300	97	60
9	35	10	14	4⅛	48	13	26	12	2½	3½	165	4400	5900	116	74
10	40	11	14	4⅛	48	13	26	14	3	4	165	4600	6100	116	74
11	45	12	14	4⅝	48	13	28	14	3	4	165	5000	6500	116	74
11½	50	13	14	4⅝	48	13	28	14	3	4	165	5400	6900	116	74
12	55	12	16	4⅝	54	15	30	16	3	4	165	5700	7700	133	79
12½	60	12½	16	4⅝	54	15	30	16	3	4	165	6100	8100	133	79
13	65	13	16	5¼	54	15	30	16	3½	4½	165	6500	8500	133	79
13½	70	13½	16	5¼	54	15	30	16	3½	4½	165	6800	8800	133	79
14	75	14	16	5¼	60	16	34	17	3½	4½	165	7100	9100	133	79
15	80	14½	16	5¼	60	16	34	17	3½	4½	165	7400	9400	133	79
16	85	15	16	5¼	60	16	36	17	4	5	165	7700	9700	133	79

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AUTOMATIC VERTICAL CENTER CRANK ENGINES

Governed automatically by an improved device contained within the fly wheel, which governor is thoroughly automatic in its action and can be easily adjusted.

These engines are symmetrical in design, made from new patterns, durable and economical in the use of steam. All material and workmanship guaranteed the best, and the finish first-class.

Care must be used to keep *valve* and *cylinder perfectly lubricated* with high grade oil. If allowed to run dry it interferes with the smooth action of the governor.

This engine has balance valve.

DIMENSIONS OF AUTOMATIC VERTICAL CENTER CRANK ENGINES. BASED ON 80 POUNDS INITIAL PRESSURE. CUT-OFF AT 1-4 STROKE

No.	Horse Power	Cylinder		Shaft Diameter	Balance Wheel		Pulley		Pipes		Revolutions per Minute	Weight	Height	
		Diameter	Stroke		Diameter	Face	Diameter	Face	Steam	Exhaust			Floor to Center of Shaft	Floor to Top of Cylinder
2	3	3	4½	1½	20	6	10	4½	½	¾	375	325	10	40
3	4	3½	4½	1½	20	6	10	4½	½	¾	375	350	10	40
4	5	4	5	1½	20	6	12	4½	¾	1	300	525	10⅝	46
5	6	4½	5	1½	20	6	12	4½	¾	1	300	575	10⅝	46
6	7	5	6½	2	20	6	14	6½	1	1¼	300	770	12¼	53¼
7	8	5½	6½	2	20	6	14	6½	1	1¼	275	850	12¼	53¼
8	10	6	8	2½	30	6¾	16	6½	1¼	1½	260	1,300	14½	62
8½	12	6½	8	2½	30	6¾	16	6½	1¼	1½	260	1,350	14½	62
9	15	7	8	2⅞	30	6¾	18	8	1½	2	260	1,400	16⅝	64½
9½	18	7½	8	2½	30	6¾	18	8	1½	2	260	1,450	16⅝	64½
10	20	7	10	2⅞	35	6¾	20	8	1½	2	260	1,750	12¼	69¼
11	25	8	10	2⅞	35	6¾	20	10	2	2½	260	1,800	12¼	69¼
12	30	8½	10	2⅞	35	6¾	20	10	2	2½	260	2,000	12¼	69¼
12½	35	9½	10	2⅞	35	6¾	24	10	2½	3	260	2,100	18⅛	69¼
13	40	10	10	3⅛	40	10½	24	10	2½	3	250	2,800	18⅛	83
14	45	10	12	3⅜	40	10½	24	12	2½	3½	250	2,800	18⅛	83
15	50	11	12	3⅜	40	10½	26	12	2½	3½	250	3,100	18⅛	83
16	60	12	12	3⅜	40	10½	26	12	2½	3½	250	3,600	18⅛	83
17	70	12	14	4⅜	48	13	28	14	3	4	250	3,900	21	91
18	75	12½	14	4⅜	48	13	28	14	3	4	250	4,200	21	91
19	80	13	14	4⅜	48	13	30	14	3	4	250	4,500	21	91
20	85	13½	14	4⅜	48	13	30	14	3	4	225	4,800	21	91
21	90	14	14	4⅜	48	13	30	16	3½	4½	225	5,300	21	91

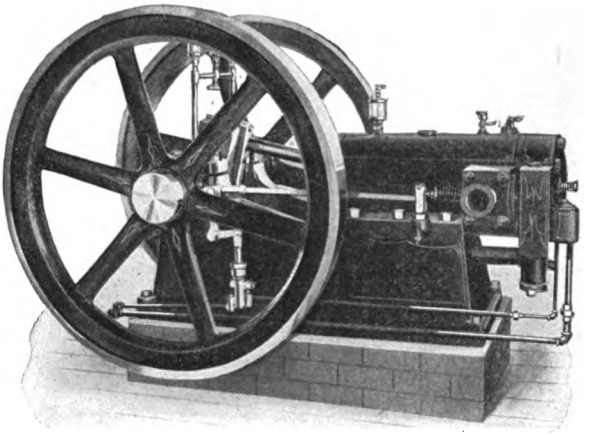
Trimmings: For Automatic Engines, a complete set of Nickel Plated Glass Oilers, Sight Feed Lubricator, Throttle Valve and Cylinder Cocks.

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McVICKER AUTOMATIC GAS AND GASOLINE ENGINES

STATIONARY AND PORTABLE



This engine has one-third the number of parts of any engine on the market. The simplest is the best.

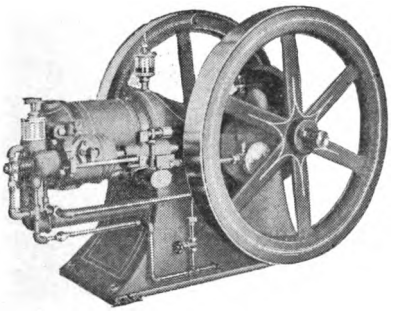
ENGINE PRICE LIST

	Regular Equipment List
2 H. P. Stationary Engine	$ 140 00
4 H. P. " "	240 00
6 H. P. " "	390 00
8 H. P. " "	450 00
10 H. P. " "	570 00
12 H. P. " "	675 00
16 H. P. " "	795 00
20 H. P. " "	950 00
30 H. P. " "	1,500 00
6 H. P. Portable Engine (All Steel)	525 00
8 H. P. " " "	600 00
10 H. P. " " "	720 00
12 H. P. " " "	825 00
16 H. P. " " "	1,005 00
20 H. P. " " "	1,275 00
2 H. P. On Skid Cir. Pump and Special Cooling Tank	158 75
4 H. P. " " " " " " " "	258 75
6 H. P. " " " " " " " "	412 50
8 H. P. " " " " " " " "	472 50

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THE MICHIGAN FIVE HORSE ENGINE

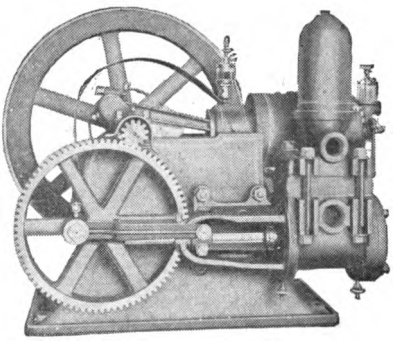


This engine is of the four cycle horizontal type, the only engine successfully compressing, firing and expelling the burnt gases. It is strong and durable, built on power lines developing full rated horse power on actual test.

Size 58 inches long, 41 inches wide and 37 inches high. Has 12 inch belt pulley with 10 inch face. Speed 275 to 350 revolutions per minute. Weight, crated for shipment, 1,150 pounds. Shipped complete with battery and connecting wire, muffler, tools, lubricating oil, and complete instructions for setting up and operating.

Prices on application.

THE NEW MODEL GAS AND GASOLINE ENGINE No. 2



This engine is a horizontal four cycle engine, the only type that gets full value from the fuel, and successfully throws off the burnt gases. It is rated at two horse power, but will develop over two horse power on actual test.

Size 39 inches long, 30 inches wide and 29 inches high. Has 6 inch belt pulley, 4 inch face. Speed 370 to 425 revolutions per minute. Weight, crated for shipment, 625 pounds. Shipped complete with battery and connecting wire, muffler, tools, lubricating oil and complete instructions for setting up and operating.

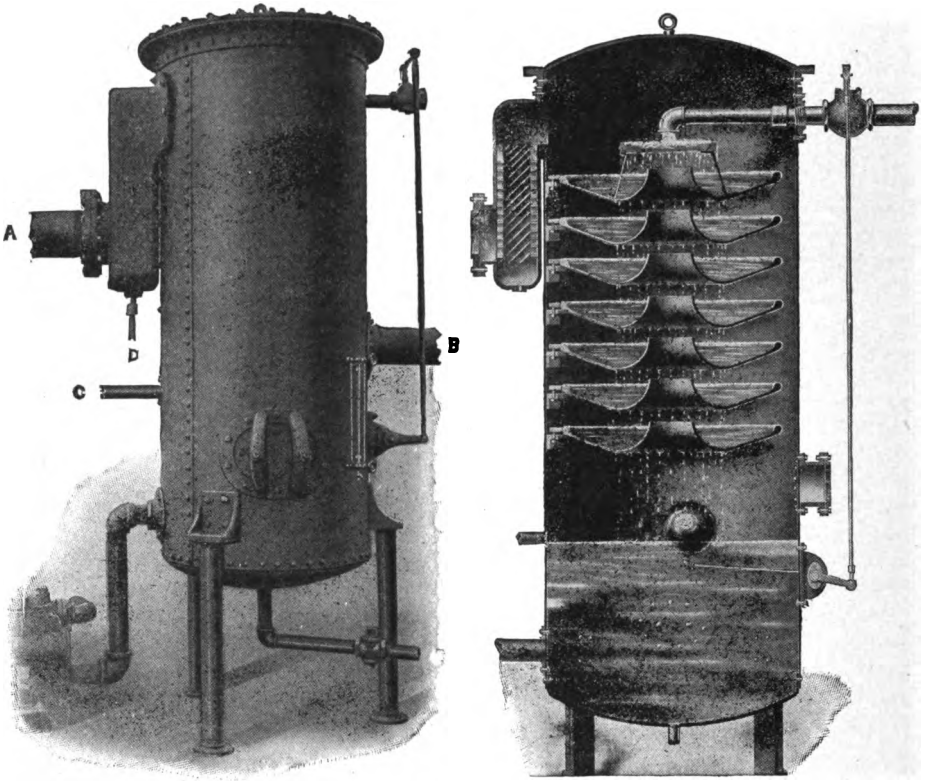
PRICE LIST No. 2

Style	H. P.	Height	Floor Space	Pulley	Revolutions	Weight	Diam. of Wheel	Price
1	2	42 in.	22x37	6x4	370 to 425	500	24	$135 00
2	2	29 in.	30x39	6x4	370 to 425	625	24	200 00
3	2	29 in.	30x39	8x4	370 to 425	590	24	150 00
3½	3½	28 in.	27x43	8x6	300 to 400	850	24	200 00
4	2	29 in.	30x39	...	370 to 425	600	25	150 00
10	5	37 in.	41x58	12x10	275 to 350	1,150	33	300 00

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THE WICKES EXHAUST STEAM OPEN FEED WATER HEATER AND PURIFIER



ADVANTAGES OF THE OPEN TYPE

1st. The exhaust steam coming in direct contact with the water, in place of being transmitted through plates and scale, less is required for heating.

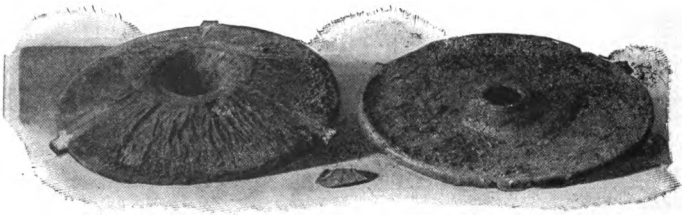
2nd. The heat in the steam condensed is saved, the condensation not requiring heating.

3rd. Less fresh water is required to be furnished and heated on account of capturing the steam condensed.

4th. The steam condensed is perfectly pure, therefore, the quality of the whole feed supply is better than the water taken from the source.

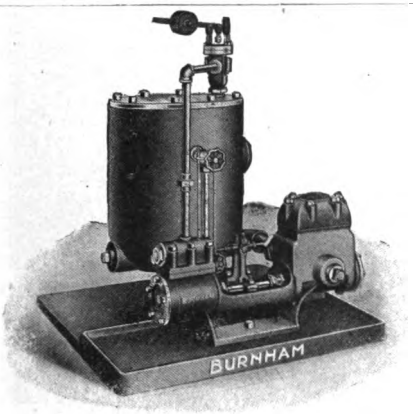
5th. The precipitation of the carbonates of lime and magnesium that are held in solution at low temperatures.

6th. The accumulation of these impurities does not affect the efficiency of the heater.



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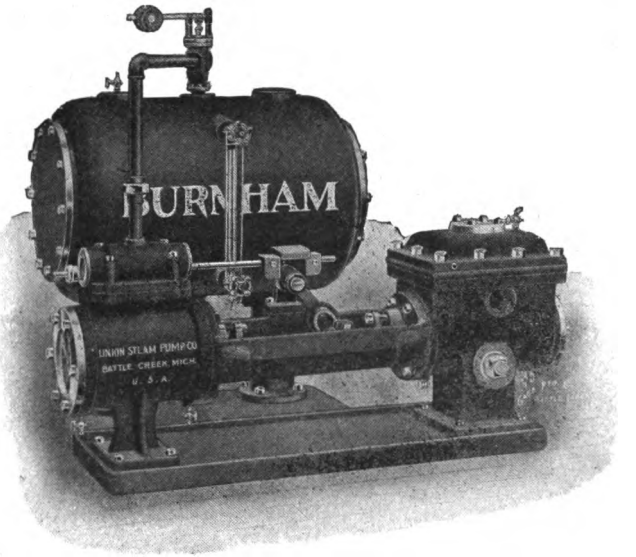
Showing style of Receiver used on 3x1¾x3 up to 4x2½x5 inclusive

BURNHAM AUTOMATIC FEED PUMP AND RECEIVER

WILL NOT SHORT STROKE

Where steam is used for heating purposes, as in hotels, apartment houses, factories and large buildings, it has been found most advantageous to include in the heating apparatus a device for automatically draining the steam pipes, coils and radiators, and *feeding the water of condensation direct to the boilers at the highest possible temperature.*

The Burnham Automatic Feed Pump and Receiver was designed to meet the requirements of this service, with the simplest and least complicated form of construction. As shown by the illustration, the Receiver and Pump are arranged very compactly upon one base plate, which is also a drip-pan, and very low, so as to allow condensation to flow from the lowest line of pipes in the heating system.



Cut shows style of Receiver on 6⅛x4x8 and larger

Number	Size of Pump	Size of Receiver	Gallons Delivered per Minute	*Square Feet Radiating Surface it will Drain	Space Occupied			Shipping Weight, Approximate	Price
					Length	Width	Height		
0 B	3 x 1¾ x 3	Oval	4	2,000	20	20	26	400	
1 B	3 x 2 x 3	"	5	2,500	20	20	26	400	
2 B	4 x 2½ x 5	"	10	5,000	26	24	33	575	
4 B	5 x 3 x 6	15 x 26	15	7,500	39	28	30	900	
5 B	5½ x 3½ x 7	19 x 28	25	12,500	40	30	36	1,250	
7 B	6⅛ x 4 x 8	19 x 28	35	17,500	45	30	36	1,300	
8 B	7⅝ x 4½ x 9	24 x 38	50	25,000	49	36	40	1,800	
9 B	8¼ x 5 x 10	24 x 38	65	32,500	56	36	40	2,250	
10 B	10 x 6 x 12	21 x 50	100	50,000	68	38	44	3,000	
11 B	12 x 8 x 12	21 x 50	155	77,500	71	38	44	3,400	

*1000 square feet of radiating surface equals about 3000 linear feet of one-inch pipe.
NOTE—Nos. 0 B, 1 B, 2 B and 4 B have only one foot under receiver.

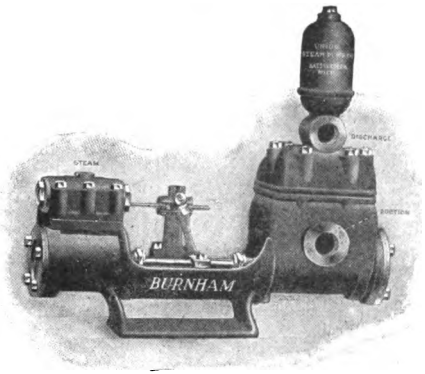
Send for complete pump catalogue.

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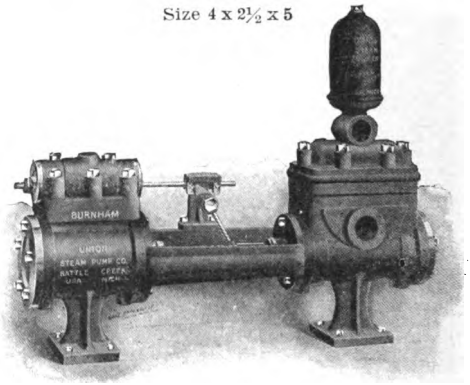
BURNHAM HIGH DUTY AND BOILER-FEED PUMPS

On this list, all pumps from 3 x 1¾ x 3 to 3 x 2 x 3, inclusive, have the steam cylinder and the water cylinder cast in one piece; 4 x 2½ x 5 to 8½ x 5½ x 10, inclusive, are made with a Cast Iron Yoke, 10 x 6 x 12 and larger sizes are made with a Steel Tie Rod Yoke.

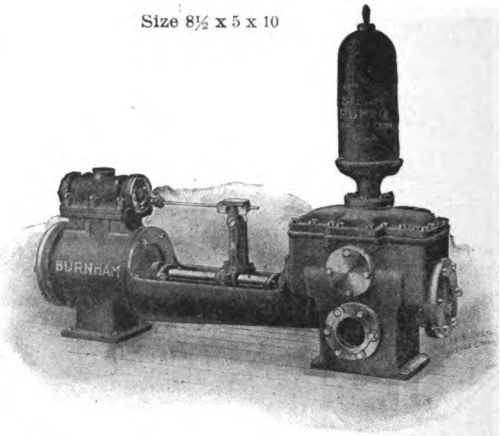
Size 3 x 1¾ x 3



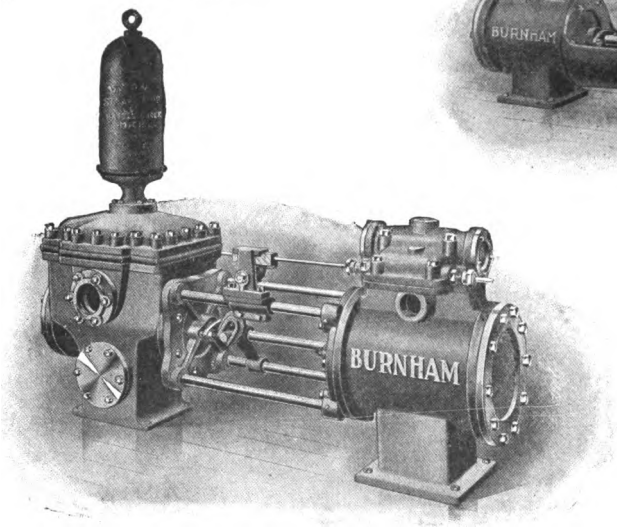
Size 4 x 2½ x 5



Size 8½ x 5 x 10



Size 10 x 6 x 12



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BURNHAM HIGH DUTY AND BOILER FEED PUMPS

WILL NOT SHORT-STROKE

The illustrations on the opposite page represent the Regular Pattern Burnham Pumps for general service, such as boiler feeding and other high-duty work, and designed for a water pressure not exceeding 150 pounds per square inch. These pumps are double-acting and have pistons arranged for square fibrous packing, and are suitable for handling hot or cold water; they are fitted with bronze piston rods, bronze water lining, bronze valve seats and bolts, and rubber valves, unless otherwise ordered; but bronze valves may be used if so desired. All water valve seats are screwed in place; rubber or bronze valves are interchangeable on same seats, bolts, and springs.

Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	As length of connections increases, larger size pipes should be used.				Gals. per Stroke	Strokes per Minute Varying with Kind of Work and Pressure	Gallons per Minute at given Number of Strokes	Gallons per Hour at Highest Speed	Horse Power of Boiler Pump will supply at Stated Speed	Lining	Price
			Steam	Exhaust	Suction	Dis'ge							
3	1¾	3	⅜	½	1¼	1	.031	80 to 175	2.48 to 5.42	325	15 to 30	P	
3	2	3	⅜	½	1¼	1	.04	80 " 175	3.2 " 7	420	20 " 40	P	
4	2½	5	½	¾	1½	1¼	.106	75 " 150	8 " 16	960	45 " 90	P	
5	3	6	½	¾	2	1½	.183	75 " 150	14 " 27	1600	80 " 160	P	
5½	3½	7	¾	1	2½	2	.291	75 " 150	22 " 44	2640	130 " 260	P	
6⅛	4	8	¾	1	2½	2	.44	75 " 150	33 " 66	3960	150 " 390	P	
7⅜	4¼	9	1	1½	3	2½	.55	75 " 125	41 " 69	4140	200 " 400	P	
7⅜	4½	9	1	1½	3	2½	.62	75 " 125	46 " 78	4680	225 " 450	P	
8½	5	10	1	1½	3½	3	.85	75 " 125	64 " 106	6360	300 " 600	R	
8½	5½	10	1	1½	3½	3	1.02	75 " 125	75 " 128	7700	350 " 700	P	
10	6	12	1½	2½	4	3	1.46	75 " 125	110 " 183	11000	550 "1100	R	
10	6½	12	1½	2½	4	3	1.72	75 " 125	129 " 215	12900	600 "1200	R	
12	7	12	1½	2½	5	4	2.00	75 " 125	150 " 250	15000	750 "1500	R	
12	7½	12	1½	2½	5	4	2.29	75 " 125	172 " 286	17000	850 "1700	R	
12	7	16	1½	2½	5	4	2.66	50 " 100	133 " 266	16000	750 "1500	R	
12	7½	16	1½	2½	5	4	3.06	50 " 100	153 " 306	18300	900 "1800	R	
14	7½	12	2	2½	5	4	2.29	75 " 125	172 " 286	17000	850 "1700	R	
14	8	12	2	2½	6	5	2.61	75 " 125	196 " 326	19560	950 "1900	R	
14	8½	12	2	2½	6	5	2.94	75 " 125	221 " 367	22000	1100 "2200	R	
14	8	16	2	2½	6	5	3.48	50 " 100	174 " 348	20800	1000 "2000	R	
14	8½	16	2	2½	6	5	3.93	50 " 100	197 " 394	23600	1150 "2300	R	
14	9	16	2	2½	6	5	4.40	50 " 100	220 " 440	26400	1300 "2600	R	
16	9	16	2	2½	6	5	4.40	50 " 100	220 " 440	26400	1300 "2600	R	
16	10	16	2	2½	8	6	5.44	50 " 100	272 " 544	32600	1600 "3200	R	
18	12	16	2½	3½	8	6	7.83	50 " 100	392 " 784	47000	2350 "4700	R	
20	14	16	2½	3½	10	8	10.66	50 " 100	533 " 1066	64000	3200 "6400	R	

"R" signifies removable bronze lining in water cylinders. "P" signifies bronze lining pressed in.

Sizes are designated by the diameter of the steam cylinder, the diameter of water cylinder, and the length of stroke.

In an emergency the above speed may be increased, but for continuous work, such as feeding boilers, we advise much lower speed.

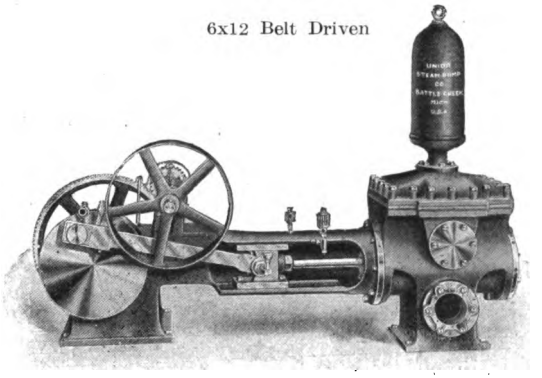
On this list, all pumps from 3x1¾x3 to 7⅜x4½x9, inclusive, are tapped for suction and discharge pipes; 8½x5x10 and larger pumps are flanged for suction and discharge pipes.

Larger sizes and other combinations of cylinders will be given upon application.

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BURNHAM ELECTRICALLY-DRIVEN OR BELT-DRIVEN BOILER FEED PUMPS

6x12 Belt Driven



These pumps find their field of usefulness where it is cheaper or more convenient to have electrical or belt power to operate the pump than to use steam direct.

These pumps are especially well constructed throughout, having brass-fitted water cylinder, bronze piston rod, and having take-up for wear at every bearing. The connecting rod has adjustable boxes; the shaft is of ample size and runs in adjustable bearings.

The gears are cut from solid blank.

Full provision is made for oiling every bearing, and a complete set of oilers is sent with each pump.

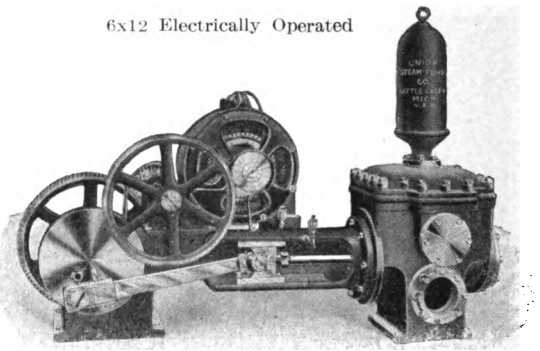
The designs shown represent a high type of Power Pump, and carry corresponding values.

The sizes smaller than 5 x 10 will carry a more simple and less expensive design.

NOTE.—Pumps on this list are designed for a pressure not exceeding 150 pounds per square inch. For higher pressures, please write for further particulars.

Other sizes upon application.

6x12 Electrically Operated



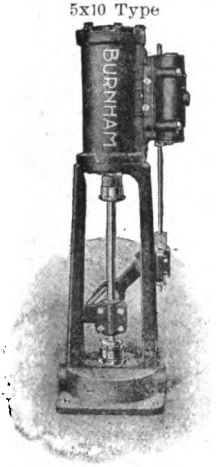
Size	Suction	Discharge	Gallons per Revolution	Revolutions per Minute	Gallons per Minute	Gallons per Hour
3 x 6	2	1½	.366	60	21.96	1315
3½x 6	2½	2	.498	60	29.88	1790
4 x 8	2½	2	.880	50	44.00	2640
4½x 8	3	3½	1.100	50	55.00	3300
5 x10	3½	3	1.700	40	68.00	4080
6 x12	4	3	2.920	30	87.60	5255
7 x12	5	4	4.000	30	120.00	7200
8 x12	6	5	5.220	30	156.60	9396
9 x12	6	5	6.600	30	198.00	11880
10 x12	8	6	8.160	30	244.80	14688

Send for complete pump catalogue.

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BURNHAM DEEP-WELL PUMPING ENGINES

5x10 Type

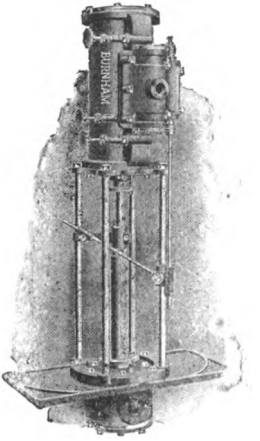


All 5- and 6-inch steam cylinders have regulating plugs to be handled by ordinary wrenches: 8-inch steam cylinders and larger have regulating plugs provided with hand-wheels.

On all, except the 5x10, the steam cylinder stands on four heavy steel columns, fastened to a U-shaped ring at the base, and the whole so arranged that the complete beam end may be swung to one side, permitting the easy withdrawal of pump piping, plunger or rods.

The 6x16 engine and larger sizes are built with a differential plunger of such diameter as to suit the working barrel and to give a constant flow of water, thus giving a double-acting effect without giving any compression strain on the pump rods: *but* the engine is furnished *without* a differential plunger, unless otherwise ordered. Price quoted with or without displacement plunger.

Type 6x16 up to 6x36

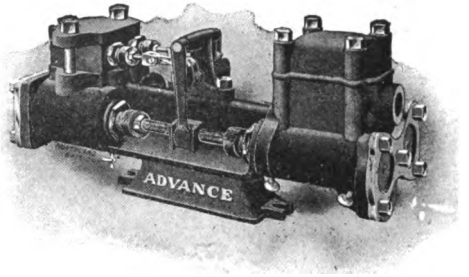


Size of Engine	Pipe Connections, in inches: Steam	Exhaust	Suction	Delivery	*Pump Rod, Threaded	Elevation of Water, Feet	Inside Diameter of Water Cylinder, in inches	Extreme Outside Diameter of Water Cylinder, in inches	Pipe Connections of Top End of Water Cylinders	Weight of Water to to be lifted at each stroke, ½ lb. to sq. in., 1 foot rise	Lifting Power of Engine at 80 lbs. Steam, less 20%	Capacity per Stroke, in gallons	Strokes per minute, one way	Capacity per minute, in gallons	Capacity per hour, in gallons
5x10	¾	1	Tapped for 2½-inch pipe.	1½	¾ pipe	25	5¾	7¼	6	325	1250	1.123	50	56.	3360
	¾	1		1½	¾ "	50	4¾	6¼	5	443	1250	.767	50	38.	2280
	¾	1		1½	¾ "	75	4¼	5¾	4½	531	1250	.613	50	30.	1800
	¾	1		1½	¾ "	100	3¾	4¾	4	552	1250	.477	50	23.85	1430
	¾	1		1½	¾ "	150	3¼	4⅝	3½	622	1250	.36	50	18.	1080
	¾	1		1½	¾ "	200	2¾	4	3	593	1250	.257	50	12.85	770
	¾	1		1½	¾ "	250	2¼	3½	2½	497	1250	.172	50	8.6	516
	¾	1		1½	¾ "	300	1¾	3¼	2	360	1250	.104	50	5.2	310
6x16	¾	1	Flanged to fit pipe, as desired, up to 6 inches.	2	1⅛	25	5¾	7¼	6	325	1809	1.798	45	80.9	4854
	¾	1		2	1⅛	50	4¾	6¼	5	443	1809	1.227	45	55.	3300
	¾	1		2	1⅛	75	4¼	5¾	4½	531	1809	.982	45	44.	2640
	¾	1		2	1⅛	100	3¾	4¾	4	552	1809	.764	45	34.	2040
	¾	1		2	1⅛	150	3¼	4⅝	3½	622	1809	.57	45	25.	1500
	¾	1		2	1⅛	200	2¾	4	3	593	1809	.41	45	18.	1080
	¾	1		2	1⅛	250	2¼	3½	2½	497	1809	.27	45	12.	720
	¾	1		2	1⅛	300	1¾	3¼	2	360	1809	.17	45	7.	420
6x24	¾	1		2	1⅛	100	3¾	5¼	4	552	1809	1.15	40	46.	2760
	¾	1		2	1⅛	150	3¼	4⅝	3½	622	1809	.86	40	34.	2040
	¾	1		2	1⅛	200	2¾	4	3	593	1809	.61	40	24.	1440
	¾	1		2	1⅛	250	2¼	3 13/16	2½	497	1809	.41	40	16.	960
	¾	1		2	1⅛	300	1¾	2 13/16	2	360	1809	.25	40	10.	600
6x36	¾	1		2	1⅛	100	3¾	5¼	4	552	1809	1.72	30	51.	3060
	¾	1		2	1⅛	150	3¼	4⅝	3½	622	1809	1.29	30	38.	2280
	¾	1		2	1⅛	250	2¼	3 13/16	2½	497	1809	.61	30	18.	1080

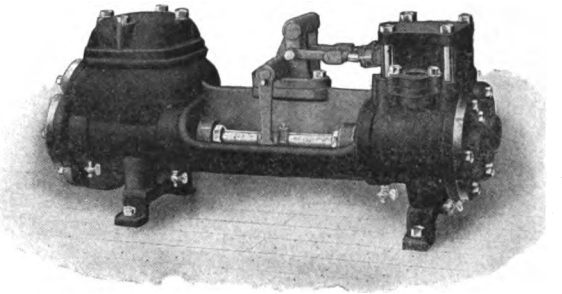
*On all Engines, except the 5x10, the Pump Rod is threaded 8 threads to the inch unless otherwise ordered.

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ADVANCE DUPLEX BOILER FEED PUMPS



These are the most economical operating duplex pumps on the market, from the fact that they do not short-stroke, and displace the full amount of water specified.



ADVANCE DUPLEX PACKED-PISTON PUMPS,

suitable for boiler feeding, fire service and general purposes. The water ends are designed to maintain a working pressure of 150 pounds per square inch. They are fitted with either soft or hard rubber or metal valves.

TABLE OF SIZES AND CAPACITIES

Diam. of steam cylinders	Diam. of water plungers	Length of stroke	Max. speed, Rev. per min.	Gal. delivered per min. at stated speed	Diam. required by single pump to do same work at same speed	Diam. of pipes in inches.			
						Steam	Exhaust	Suction	Discharge
3	1½	3	125	12	2⅛	⅜	½	1¼	1
3	2	3	125	20	2⅞	⅜	½	1¼	1
4	2½	4	100	35	3¾	½	¾	2	1½
4½	2¾	4	100	40	4	½	¾	2	1½
5¼	3½	5	100	80	5	1	1¼	2½	1¼
6	4	6	75	95	5⅝	1	1½	3	2
7	4½	8	75	160	6⅜	1¼	1½	4	3
8	4½	10	64	160	6⅜	1½	2	5	4
8	5	10	64	215	7⅛	1½	2	5	4
10	5½	10	64	255	7¾	2	2½	5	4
10	6	10	64	300	8½	2	2½	5	4

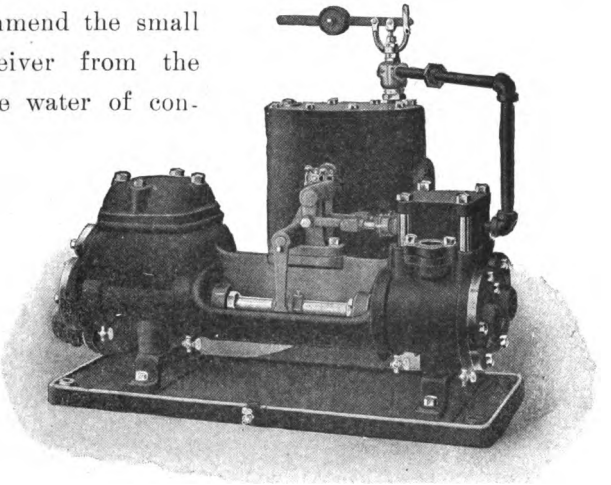
Other sizes and combinations will be furnished to order for any particular condition of service. We solicit your correspondence.

Send for complete pump catalogue.

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ADVANCE BOILER FEED PUMPS AND RECEIVERS

We recommend the small vertical receiver from the fact that the water of condensation is returned to boiler much earlier, thereby much higher in temperature.



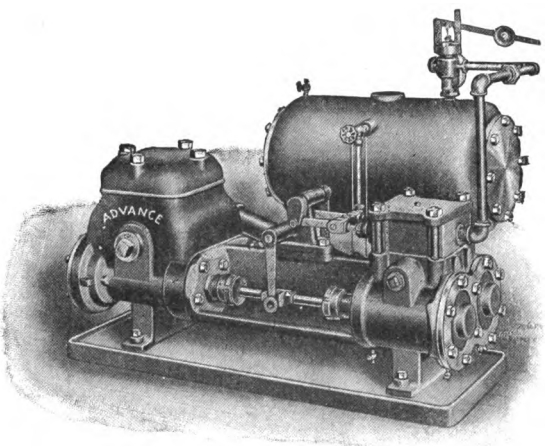
These pumps are perfectly automatic and very efficient.

This combination is especially adapted for handling condensation from steam coils, heating systems, drying cylinders, dry kilns, etc., and where it is desirable to have the pump stop automatically when condensed water is removed and start again when fresh accumulation occurs. Special attention is given to these pumps when it is required that they shall operate on low pressure steam.

TABLE OF SIZES AND CAPACITIES

Size of Pump	Gallons delivered per minute	Approximate square feet of heating surface drained	Space occupied		
			Length	Width	Height
3 x 2 x 3	12	5,000	28	21	21
4½ x 2¾ x 4	20	10,000	36	28	26
5¼ x 3½ x 5	35	20,000	42	31	29
6 x 4 x 6	60	40,000	47	32	31
7 x 4½ x 8	80	60,000	55	43	36

These pumps are built regularly with vertical receivers.

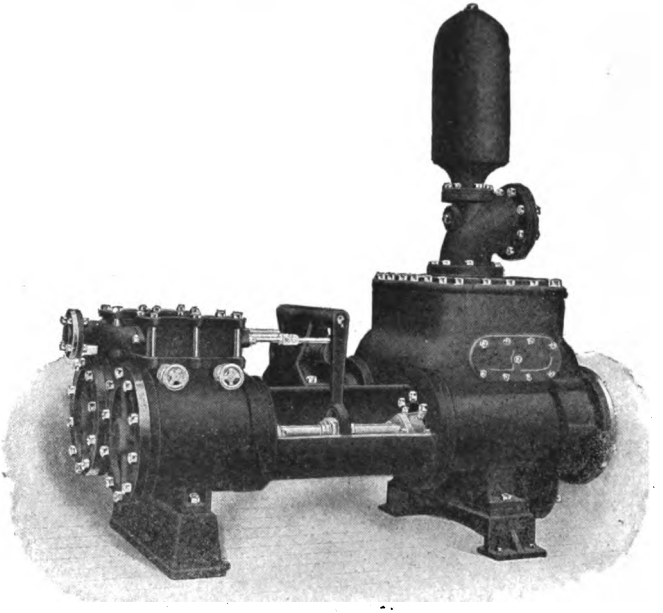


We build the horizontal type only on special order.

SEND FOR COMPLETE PUMP CATALOGUE

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GENERAL SERVICE PUMP



This type of pump is the one most commonly used. They make a most excellent general service as well as boiler feed pump.

These pumps are built either simple or compound, and when compounded any desired ratio of steam cylinders may be obtained. If desired, these pumps may be fitted with our special ring and plunger instead of the packed piston.

Diam. of Steam Cylinders	Diam. of Water Plungers	Length of Stroke	Max. Speed, Rev. per Minute	Gal. Delivered per Minute at Same Speed	Diam. Required by Single Pump to do Same Work at Same Speed	Diameter of Pipes in Inches			
						Steam	Exhaust	Suction	Discharge
12	6½	12	55	380	9⅛	2½	3	6	5
12	7	12	55	430	9⅞	2½	3	6	5
14	7	12	55	430	9⅞	2½	3	6	5
12	8½	12	55	655	12	2½	3	6	5
14	8½	12	55	655	12	2½	3	6	5
14	10	12	55	892	14⅛	2½	3	8	7
16	10	12	55	892	14⅛	2½	3	8	7
18	10	12	55	892	14⅛	3	4	8	7
16	12	12	55	1,290	17	2½	3	10	8
18	12	12	55	1,290	17	3	4	10	8
20	12	12	55	1,290	17	4	5	10	8
18	14	12	55	1,750	19¾	3	4	12	10
20	14	12	55	1,750	19¾	4	5	12	10

Send for complete pump catalogue.

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ADVANCE DUPLEX OUTSIDE CENTER PACKED PLUNGER PUMPS

This type of pump is suitable for all conditions of service, but we more particularly recommend it for use against high pressure, and when the liquid to be handled carries with it large quantities of grit, sand or gravel. The water end is designed to maintain 250 pounds working pressure. They make most ideal boiler feeders.

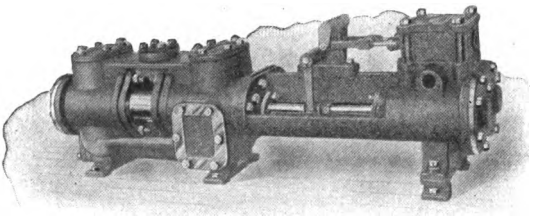
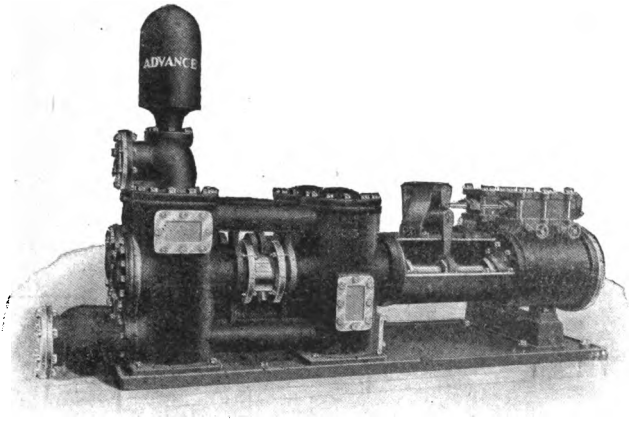


TABLE OF SIZES AND CAPACITIES

Diameter of Steam Cylinders	Diameter of Water Plungers	Length of Stroke	Maximum Speed, Revolutions per Minute	Gallons Delivered per Minute at Stated Speed	Diameter Required by Single Pump to do Same Work at Same Speed	Diameter of Pipes in Inches			
						Steam	Exhaust	Suction	Disch'ge
6	4	6	75	95	5⅝	1	1½	3	2
7	4½	8	75	160	6⅜	1¼	1½	4	3
8	5	10	64	215	7⅛	1½	2	5	4
10	6	10	64	300	8½	2	2½	5	4
12	7	12	55	430	9⅞	2½	3	6	5
14	8½	12	55	655	12	2½	3	6	5
16	10	12	55	892	14⅛	2½	3	10	8
18	10	12	55	892	14⅛	3	4	10	8
18	12	12	55	1,290	17	3	4	12	10
20	12	12	55	1,290	17	4	5	12	10
20	14	12	55	1,750	19¾	4	5	12	10



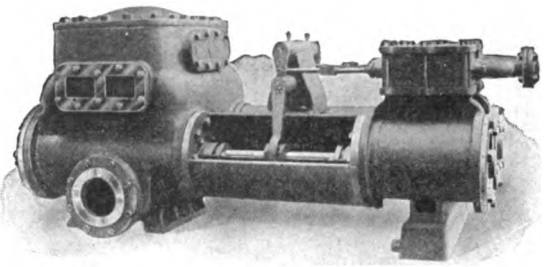
Advance Pumps take full length of stroke and make full displacement.

Unequaled for elevator and boiler feed service. This style made in the 12-inch stroke only.

Send for complete pump catalogue.

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ADVANCE DUPLEX LOW SERVICE OR TANK PUMPS



This type of pump is recommended wherever large quantities of liquid are to be pumped against low heads, and is suitable and largely used at railroad water stations, gas and oil works, tanneries, breweries, refineries, distilleries, quarries and clay pits, and on ship board as bilge or ballast pumps. A variety of valves are used, adapted for pumping hot, cold, thick, alkaline or other liquids.

Diam. of Steam Cylinders	Diam. of Water Pistons	Length of Stroke	Max. Speed, Rev. per Minute	Gal. Delivered per Minute at Same Speed	Diam. of Single Pump to do Same Work at Same Speed	Diameter of Pipes in Inches			
						Steam	Exhaust	Suction	Discharge
4½	3¾	4	100	75	5¼	½	¾	2½	2
5¼	4¾	5	100	152	6¾	1	1¼	3	2½
6	5¾	6	75	200	8⅛	1	1½	4	3
7	6	8	75	232	8½	1¼	1½	5	4
7	6¾	8	75	372	9½	1¼	1½	5	4
8	8½	12	55	655	12	2	2½	6	5
8	10	12	55	892	14⅛	2	2½	8	7
10	10	12	55	892	14⅛	2	2½	8	7
10	12	12	55	1,290	17	2	2½	10	8
12	12	12	55	1,290	17	2½	3	10	8
12	14	12	55	1,750	19¾	2½	3	12	10
14	14	12	55	1,750	19¾	2½	3	12	10

Besides those listed above, many other sizes and combinations may be obtained.

The first five sizes listed above are also constructed for vacuum service.

Air chambers are furnished at a small additional cost on the twelve inch stroke pumps.

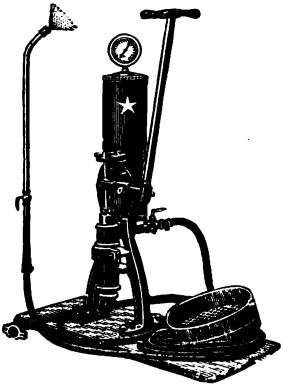
The above style furnished in the twelve inch stroke pump only.

Send for complete pump catalogue.

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STAR WHITEWASHING AND SPRAYING MACHINES

"A"



STYLE "A" MACHINE

This is the largest and best machine on the market today. We recommend it for those having a large amount of cleaning to do continuously or at short intervals.

Capacity equal to 30 men with brushes.

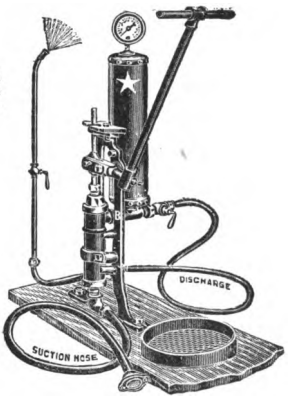
EQUIPMENT

Spray pipe complete with ¼-inch cock and spray nozzle, one extra spray tip, 200-pound pressure gauge, special galvanized sieve, follower wrench, ¾-inch discharge cock, one length of 1-inch suction hose and 20 feet of ½-inch Star special discharge hose.

List Price, (subject to discount)....$44 00

Net weight, 80 lbs. Gross weight, 100 lbs.

"B"



STYLE "B" MACHINE

This machine is of the same excellent construction throughout and built along the same lines as the style "A," with the exception that it has a smaller pumping cylinder and lighter frame.

Capacity equal to work of 20 men with brushes.

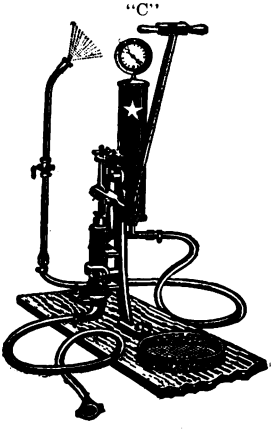
EQUIPMENT

Spray pipe complete with ¼-inch cock and spray nozzle, one extra spray tip, 200-pound pressure gauge, special galvanized sieve, follower wrench, ¾-inch discharge cock, one length of 1-inch suction hose, and 20 feet of ½-inch Star special discharge hose.

List Price, (subject to discount)....$38 00

Net weight, 70 lbs. Gross weight, 85 lbs.

"C"



STYLE "C" MACHINE

The "C" Machine is equally as well constructed as the style "B" and is equipped with the same size pumping cylinder and frame, the air chamber though is much smaller.

Capacity equal to work of 16 men with brushes.

EQUIPMENT

Spray pipe complete with ¼-inch cock and spray nozzle, one extra spray tip, 200-pound pressure gauge, special galvanized sieve, follower wrench, one length of 1-inch suction hose, and 10 feet of ½-inch Star special discharge hose.

List Price, (subject to discount)....$31 00

Net weight, 65 lbs. Gross weight, 80 lbs.

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SWARTWOUT CAST IRON EXHAUST HEADS



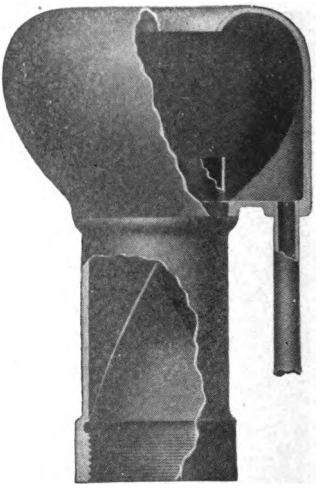
The "Swartwout" Cast Iron Exhaust Head is light in weight. Simplicity in itself, yet positive in operation and artistic in design. For these and other good reasons it has "Whirled to the Top," and is now recognized as the *standard* for quality the world over by all prominent steam engineers and steam users.

The fine points about the "Swartwout" construction are these: First, it is of *cast iron* and lasts a lifetime; second, it always separates and carries off the destructive elements; third, it never causes *back pressure;* fourth, it is light in weight; fifth, it is ornamental.

We all know an exhaust head should prevent the water and oil sustained in the steam from escaping into the air, scattering over and damaging surrounding property. The "Swartwout" Exhaust Head will do this and will last almost indefinitely.

PRICE LIST

Size of Exhaust Pipe in Inches	Price	Size of Exhaust Pipe in Inches	Price
1 or 1½	$20 00	12	$150 00
2 or 2½	25 00	14	200 00
3 or 3½	30 00	16	250 00
4 or 4½	40 00	18	300 00
5	50 00	20	360 00
6	60 00	22	
7	75 00	24	
8	90 00	30	
10	125 00	36	



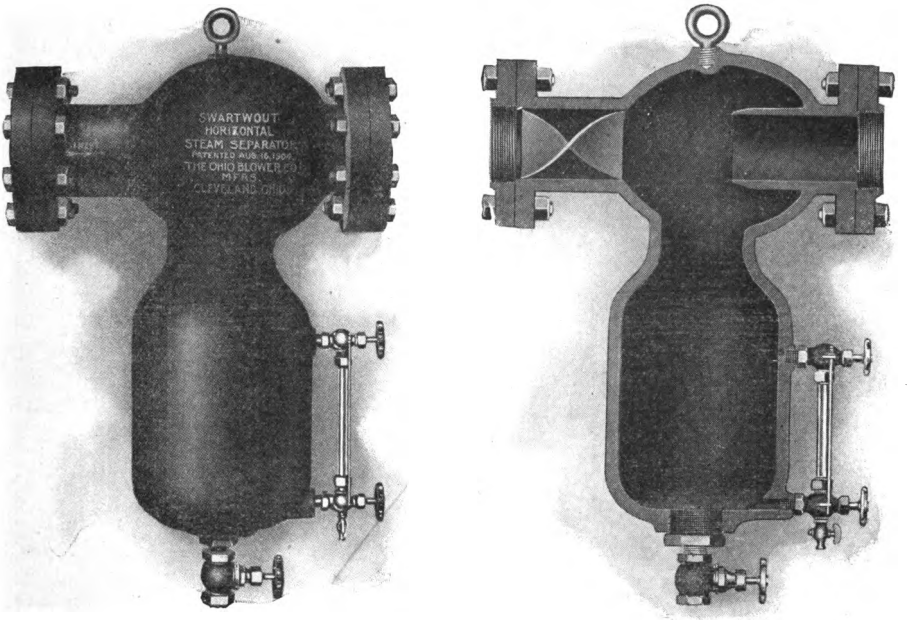
We guarantee "Swartwout" Exhaust Heads to completely entrap the water and oil and produce no back pressure on the engine.

Will ship on 30 days' trial and subject to our guarantee of *perfect satisfaction.*

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THE SWARTWOUT HORIZONTAL STEAM SEPARATORS

PATENTED AUGUST 16, 1904



The "Swartwout" Horizontal Steam Separator, like the "Swartwout" Vertical, obtains its high efficiency by employing centrifugal force. The machine is the acme of simplicity. The water laden steam as it enters strikes the helical worm, causing it to rapidly rotate. The resultant centrifugal force drives the water to the periphery of the machine when it trickles to the bottom by gravity and escapes out of the drip pipe provided for that purpose. The steam, freed from water, passes through the center of the separator to the engine cylinder. In this machine the steam has a continuous flow *always in the same direction.* A valuable feature not possessed by any other. These separators are provided with large reservoirs for steam, giving high initial velocity at the engine, preventing vibration of steam pipes due to the rapid opening or closing of steam valves. This reservoir also takes care of any sudden flood of water from the boiler, preventing the possible wrecking of the engine. Note the entire absence of baffle plates or other obstructions to the easy flow of the steam. It is provided with an eye bolt to facilitate installation. The separator should be placed as near the engine as possible.

PRICE LIST OF "SWARTWOUT" HORIZONTAL STEAM SEPARATORS

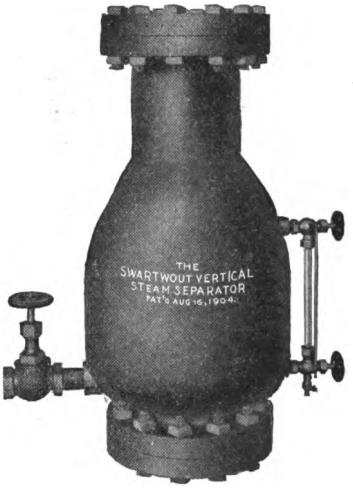
Size, Inches	Price	Size, Inches	Price
1	$20 00	4½	$80 00
1½	25 00	5	95 00
2	35 00	6	120 00
2½	45 00	7	140 00
3	50 00	8	175 00
3½	60 00	10	250 00
4	70 00	12	300 00

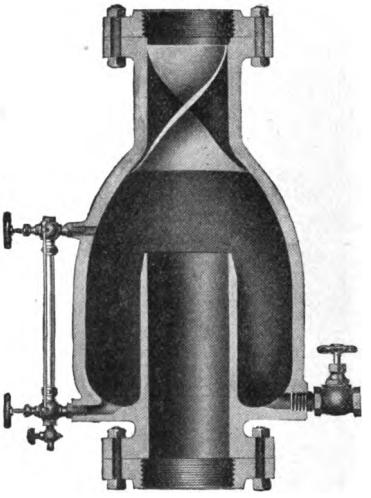
Prices include flanges, bolts, water-gauges, outlet-valve and nipple. Special prices quoted on larger sizes upon application.

All separators are tested at 450 pounds hydrostatic pressure, and are guaranteed for a working pressure of 150 pounds. Will ship on 30 days' trial, subject to our guarantee of perfect satisfaction.

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THE SWARTWOUT VERTICAL STEAM SEPARATOR





A separator that will demonstrate its value on a water test, without the high pressure of steam, is certain to prove efficient and reliable when put to the use for which it is intended.

The secret of a perfect separator is simplicity, and nothing could be less complicated than the mechanism that is necessary to put into operation this easily understood principle of centrifugal force contained in the above type of separator.

PRICES

Size, Inches	Price	Size, Inches	Price
1	$20 00	4½	$80 00
1½	25 00	5	95 00
2	35 00	6	120 00
2½	45 00	7	140 00
3	50 00	8	175 00
3½	60 00	10	250 00
4	70 00	12	300 00

Special prices quoted on larger sizes upon application.

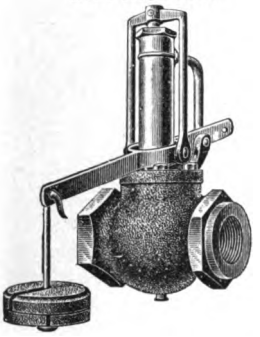
All separators are tested at 450 pounds hydrostatic pressure and are guaranteed for 150 pounds working pressure.

Will ship on 30 days' trial and subject to our guarantee of perfect satisfaction.

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DAVIS PRESSURE REGULATORS

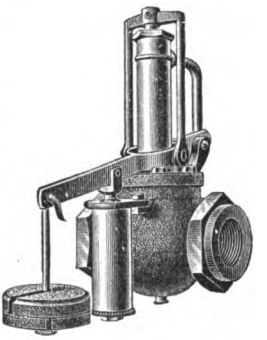
No. 1 Regulator



THE DAVIS PRESSURE REGULATOR is an automatic valve designed for the reduction of any high initial pressure to any constant delivery pressure. Its fundamental principle is the balancing of pressure by direct weight. It is simple in construction and has no springs, packings, toggles or diaphragm which are generally found in this class of valve, and which are weak and troublesome points in any automatic device. Its operation is controlled entirely by the pressure on the low pressure side of the valve, and after being once set to deliver the desired pressure it will automatically maintain that pressure constant irrespective of any fluctuation of the initial pressure.

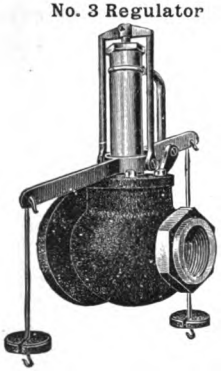
Standard valves are made for steam at a maximum pressure of 150 pounds and any delivery pressure less than 40 pounds. Valves for higher pressures are made special, and when the delivery pressure is greater than 40 pounds are equipped with a high pressure cylinder, which is smaller in diameter than the standard, and a longer lever, the object being to avoid excessive weighting.

No. 2 Regulator



The No. 1 style of Regulator should be used where there is no pulsation or vibration in the pressure. No. 2 has a dash pot or oil cylinder which will prevent jumping or chattering under all conditions and should be used when the pressure is not constant. No. 3 has an expanded outlet and allows the steam to expand quickly and reduce in velocity after it has passed through the valve. No. 5 is for steamship service and has a sliding ball weight so the rolling motion of the boat will not affect its operation.

No. 3 Regulator



By a slight change in the inner construction these valves can be used for air or water reduction as well as for steam, and when wanted for this service it should be specified on the order.

Straight-way Valves up to 1¼" inclusive are made of brass; 1½" and over have iron bodies with brass trimmings. Sizes from ½" to 1½" inclusive have screwed ends only; 7" and over have flanged ends only. Expanded outlet valves have iron bodies with brass trimmings; sizes 1½ x 3" and 2 x 4" have screwed ends only; 2½ x 5" and 3 x 6" have inlet screwed and outlet flanged; 4 x 8" and over have inlet and outlet flanged only.

PRICE LIST—DAVIS PRESSURE REGULATORS Nos. 1 AND 2

SIZE, INCHES	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	7	8	10	12	14
Price No. 1.....each	$20	20	22	24	25	30	35	40	50	60	75	100	135	175	275	400	500
Price No. 2.....each	25	25	27	29	30	36	42	48	58	70	90	120	160	200	300	435	600
Length, face to face, screwed end valve	3¼	3¼	4	4½	6¾	7⅞	7⅞	9¼	10¾	10¾	12	13					
Length, face to face, flanged end valve						7⅞	7⅞	9¼	10¾	10¾	12	13	14	16¾	18½	22	24½

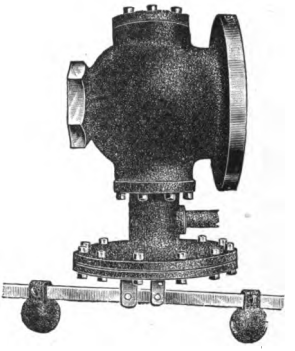
PRICE LIST—DAVIS PRESSURE REGULATOR No. 3

SIZE, INCHES	1½ x 3	2 x 4	2½ x 5	3 x 6	4 x 8	5 x 10	6 x 12	8 x 14
Price No. 3.....each	$40 00	50 00	65 00	85 00	135 00	195 00	280 00	360 00
Length, face to face, inches	7¼	8	9	10	12½	15	17½	20½

The Diameter of all Flanges is Manufacturers' Standard.

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DAVIS P. & W. REDUCING VALVE



This Reducing Valve is especially designed to meet the requirements of the Paul or the Webster Systems of steam heating, but is satisfactory for any low pressure or vacuum system. The governing pressure is brought to bear upon the diaphragm through a small pipe taken from the low pressure main at some distance from the Regulator where an average pressure on the system is maintained.

It should be placed in a horizontal position, preferably with the diaphragm facing down, that the water of condensation which forms in the diaphragm chamber may protect it from the heat of the steam.

The 2 x 4" Valve has both ends screwed; 2½ x 5" and 3 x 6" have inlet screwed and outlet flanged; 4 x 8" and over have both ends flanged.

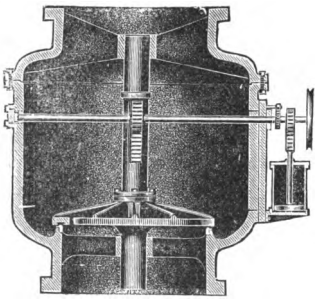
PRICE LIST.—P. & W. REDUCING VALVE

Size, inches	1½ x 3	2x4	2½ x5	3x6	4x8	5x10	6x12	8x14
Price	$50 00	$60 00	70 00	100 00	130 00	200 00	300 00	400 00
Length, face to face, inches	7¼	8	9	10	12½	15	17½	20½

These valves are also made straightway. Prices on application.

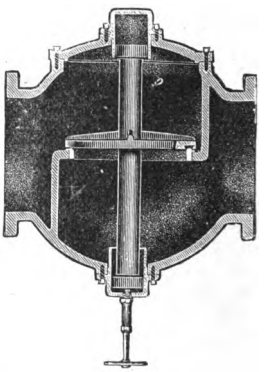
DAVIS AUTOMATIC EXHAUST RELIEF VALVES

VERTICAL



These Valves are designed for use with condensing engines to relieve direct to the atmosphere any pressure which may accumulate in the condenser, if for any reason the vacuum is lost. They are generally placed in a branch leading from the main exhaust pipe to the atmosphere. As long as a vacuum is maintained in the condenser, the Relief Valve remains closed, but if the air pump fails, the injection water stops, or for any other reason the vacuum is lost, the valve immediately opens and allows the engine to exhaust into the atmosphere and run non-condensing until the vacuum is restored, when it will close automatically.

HORIZONTAL



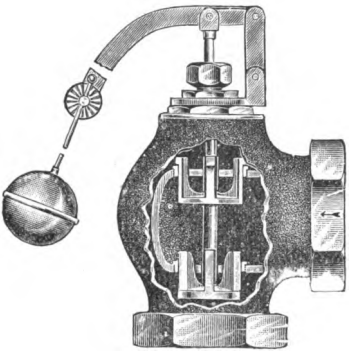
PRICE LIST—RELIEF VALVES

Size, inches	6	8	10	12	14	16	18	20	22	24	26	28	30
Price, Horizontal or Vertical, each	$100	170	270	335	415	500	584	670	917	1170	1420	1600	2000
Length, face to face Horizontal type	16	20	24	29	32	36¾	39¾	43¼	46½	52	52	63	60
Length, face to face Vertical type	14	16	16½	21	24	26	26	36	39	42	44½	48	52

Made with flanged ends only. Diameter of flanges is manufacturer's standard.

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DAVIS FLOAT VALVE



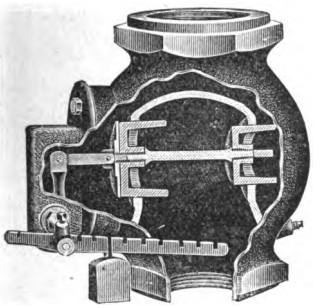
This valve is designed to automatically control the admission of water into a tank by the rise and fall of the water level in the tank. The inner valve is of the double-seated piston type and is perfectly balanced. Directly connected to it by means of a stem and lever is a float which controls its movement. In a normal position this inner valve is open and allows the water to flow from the inlet pipe into the tank. When the level in the tank rises to a point of contact with the float the valve closes.

The distinctive features of this valve are its full area of the inlet pipe through the seats, giving it a large capacity, and the direct connection of the inner valve to the float, which assures positive control. The small corrugated wheel at the end of the lever provides for the adjustment of the float at any desired angle. Standard valves are made for cold water at any working pressure up to 200 lbs.; either angle or straight-way valves for hot water are made to order.

Valves from ¾ to 1¼ inch inclusive are constructed of brass; 1½ inch and over have iron bodies and brass trimmings. When ordering valves for hot water the temperature should be given, otherwise valves for cold water will be sent.

Size..... Inches	¾	1	1¼	1½	2	2½	3	3½	4	5	6	7	8	10	12	
Price each, straightway or angle with float.....	$9	11	12	14	16.50	21.50	29	34	39	49	60	70	80	100	140	
Face of inlet to center of outlet { scd.....	1⅝	2	2¼	3⅜	3 1/16	3 1/16	4⅝	5⅜	5⅜	6	6½					
	figd.....					3 1/16	3 1/16	4⅝	5⅜	5⅜	6	6½	7	8⅜	9¼	11
Face to face Straightway { scd.....	3¼	4	4½	6¾	7⅞	7⅞	9¼	10¾	10¾	12	13					
	figd.....					7⅞	7⅞	9¼	10¾	10¾	12	13	14	16¾	18½	22
Diameter Copper Float.....	8	8	8	8	8	8	10	10	10	10	10	10	10	10	10	
Approximate weight.....	20	20	20	25	35	45	75	90	95	130	185	200	300	400	650	

Screwed



DAVIS IRON BODY, NOISELESS BACK PRESSURE VALVES

BRASS MOUNTED, SCREWED AND FLANGED FOR NON-CONDENSING ENGINES ONLY

BACK PRESSURE VALVES, SCREWED

Size..... Inches	2	2½	3	3½	4	4½	5	6	7
Price..... Each	$ 14 00	16 00	18 00	22 00	25 00	30 00	40 00	60 00	80 00
End to End..... Inches	7½	7½	8⅝	9¼	10¼	11	12	13½	15

BACK PRESSURE VALVES, FLANGED

Size..... Inches	3	3½	4	4½	5	6	7	8	9
Price..... Each	$ 18 00	22 00	25 00	30 00	40 00	60 00	80 00	100 00	120 00
Diam of Flange..... Inches	7½	8½	9	9¼	10	11	12½	13½	15
Face to Face..... "	8½	9	10	11	11½	13	14½	16½	18

Size..... Inches	10	12	14	15	16	18	20	22	24
Price..... Each	$145 00	220 00	345 00	400 00	465 00	600 00	750 00	900 00	1050 00
Diam. of Flanges..... Inches	16	19	21	22¼	23½	25	27½	29½	37
Face to Face..... "	19	22	24	24	27½	28½	30½	38	58

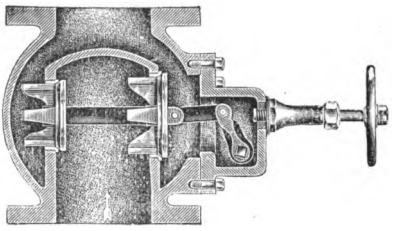
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DAVIS CLASS A–AUTOMATIC STOP AND CHECK VALVE

GUARANTEED NOISELESS

SUITABLE FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

EXTRA HEAVY GLOBE OR ANGLE PATTERN



In modern practice two or more boilers are generally used in a battery all delivering their steam to one header, and in case of an accident to any one of them the steam from all the boilers would be given an opening to the atmosphere and the loss of human life or the destruction of valuable property would result.

The Davis Stop and Check Valve is designed to act automatically in such emergencies and prevent a reverse flow of steam from all the boilers. It is primarily and ultimately an automatic safety device. It should be placed in the pipe leading from the nozzle of the boiler to the header. As long as the flow of steam is from the boiler to the header it will remain open, but in case of an accident, such as the blowing out of a tube, the failing of a crown sheet, or the blowing off of a cock, the valve will automatically close and prevent a reverse flow of steam.

This valve is controlled entirely by the flow of steam, pressure not affecting its operation in any way. It has an outside lever which provides a means of testing the free movement of the inner valve at any time, and which also acts as an indicator, showing whether the valve is open or closed. It has no internal dash pot, small ports, or delicately adjusted parts to require continual attention. Its absolute simplicity is one of its distinctive features.

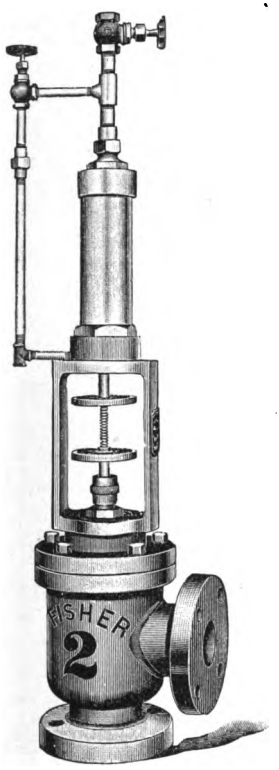
PRICE LIST–STOP AND CHECK VALVES

Size.....Inches	4	5	6	7	8	10	12
Price, each.....	$35 00	40 00	50 00	60 00	75 00	125 00	200 00
Face to face, straightway....	14¾	14¾	15½	19½	19½	22½	23½
Center to face, angle.....	7⅜	7⅜	7¾	9¾	9¾	11¼	11¾
Diameter of flanges, ex. heavy	10	11	12½	14	15	17½	20

Send for complete catalogue.

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FISHER AUTOMATIC PUMP GOVERNOR



Regulates the pressure of the pump so it cannot exceed the pressure at which it is set. The regulation is very simple and is quickly made. Loosen the upper lock wheel by turning to the left; adjust with the lower wheel until the desired pressure is reached then lock the upper wheel by turning to the right. There is a wide limit of variation in pressure with the different size springs used.

The spring and hydraulic pressures should always be given with each order. This is important in order that we may fit the governor for the service for which it is intended.

Special governors provided for air compressors, carrying a very low pressure, or as high as desired.

Screwed angle pattern always shipped, on one-half to three-inch inclusive, unless otherwise specified in the order.

Brass pipe work used on all governors, which conforms to the rules and regulations of the Underwriters Fire Associations.

The valves and seats are made of the best phosphor-bronze.

The flanges on our governors are "Master Steam and Hot Water Fitters' Standard." Governors with special flanges made to order.

SCREWED

⅜ & ½ inch	$25 00
¾ inch	27 50
1 "	30 00
1¼ "	35 00
1½ "	42 50
2 "	50 00
2½ "	58 00
3 "	70 00

FLANGED

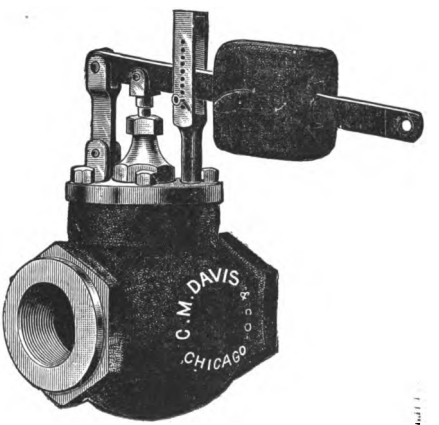
1 "	35 00
1¼ "	40 00
1½ "	45 00
2 "	50 00
2½ "	60 00
3 "	75 00
3½ "	87 50
4 "	100 00
5 "	125 00
6 "	150 00
8 "	225 00

DAVIS BALANCED VALVE WITH LEVER

FOR STEAM, AIR, GAS, WATER, OR ANY OTHER FLUID

Any kind of movement can be applied for operating the lever to open and close the valve, making it a convenient valve to use in many places.

None but the best of material is used throughout its entire construction, and is just what its name implies—a perfectly balanced valve.



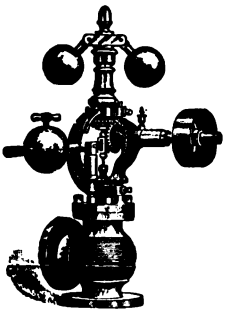
PRICE LIST

DAVIS BALANCED VALVE

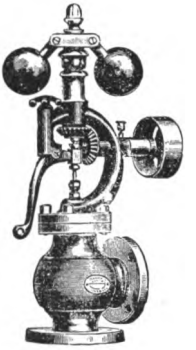
¼ inch brass body	$6 50
⅜ " " " "	6 50
½ " " " "	8 00
¾ " " " "	9 50
1 " " " "	11 00
1¼ " iron body, brass trimmed	14 00
1½ " " " "	19 00
2 " " " "	25 00
2½ " " " "	30 00
3 " " " "	35 00
3½ " " " "	45 00
4 " " " "	55 00
5 " " " "	65 00
6 " " " "	75 00
7 " " " "	
8 " " " "	

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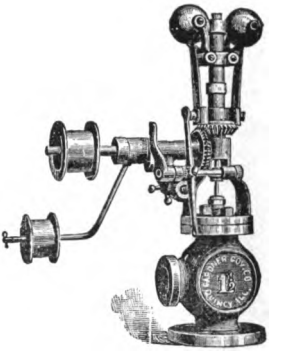
GARDNER GOVERNORS



STANDARD—Class A.



STANDARD—Class B.



SPRING—Class A.

The Standard is recommended principally for slow and medium speed stationary engines, and the SPRING, designed particularly for high-speed and portable engines.

When ordering state if plain or finished is wanted; the style—Spring or Standard; class "A" or "B" and style of valve chamber.

If the speed of the engine is given with the diameter of the pulley on the engine shaft, we will furnish the proper size pulley for the Governor. When this is not given, the size of pulley mentioned in table of dimensions will be sent.

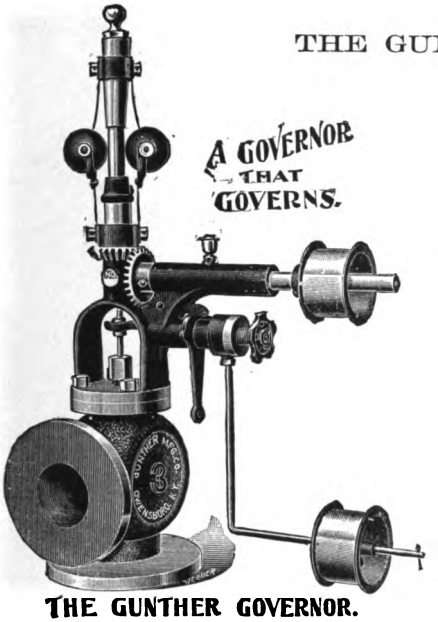
PRICE LIST

Of Gardner, Pickering, Judson & Waters Governors.

Size of Governor Diameter of Opening.	½	¾	1	1¼	1½	2	2¼
Price Class "B"—Plain	$14 00	16 00	18 00	21 00	25 00	30 00	35 00
Price Class "B"—Finished	16 00	18 00	20 00	24 00	29 00	34 00	40 00
Price Class "A"—Plain		18 50	21 00	24 50	29 50	36 00	42 00
Price Class "A"—Finished		20 00	23 00	27 50	33 50	40 00	47 00

Size of Governor Diameter of Opening.	2½	3	3½	4	4½	5	6
Price Class "B"—Plain	$40 00	50 00	60 00	71 00	83 00	94 00	122 00
Price Class "B"—Finished	45 00	58 00	69 00	81 00	94 00	106 00	136 00
Price Class "A"—Plain	48 00	59 00	71 00	83 00	96 00	109 00	140 00
Price Class "A"—Finished	53 00	67 00	80 00	93 00	107 00	121 00	154 00

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THE GUNTHER GOVERNOR.

THE GUNTHER GOVERNOR

This machine is designed to overcome the weak points of all the others; is a very sensitive machine, and at the same time a machine that will outwear any of the others. There are practically only three wearing parts to this machine—namely, the *shaft*, the *gears* and the *ball pins*. Great care is taken to perfect these three. The pins are babbitted the full length of the balls, and are stationary in the yoke. They are also standard taper, and, should they wear in time, the wear of years can be taken up in a moment by tightening the pins with a screw driver. The length of the shaft bearing is about ten times the diameter of the shaft, and said bearing is babbitted with the best genuine metal. The gears are cut practically perfect from the solid material, and therefore wear uniformly and very slow, and at the same time run noiseless.

PRICE LIST OF GUNTHER GOVERNORS

Size.....inches	¾	1	1¼	1½	2	2¼	2½	3	3½	4	4½	5	6
Plain	$16 00	18 00	21 00	25 00	30 00	35 00	40 00	50 00	60 00	71 00	83 00	94 00	122 00
With Automatic Stop	19 00	21 00	24 50	29 50	36 00	42 00	48 00	59 00	71 00	83 00	96 00	109 00	140 00

TABLE OF DIMENSIONS OF GUNTHER GOVERNORS

Size.....inches	¾	1	1¼	1½	2	2¼	2½	3	3½	4	4½	5	6
Diameter Base Flange	Scrd.	Scrd.	Scrd.	5½	7	7	8	9	10	11	11½	12	14
Diameter Side Flange	Scrd.	Scrd.	Scrd.	Scrd.	Scrd.	7	7	8	9	9	9½	10	11
From Center to Side Flange	2¼	2¾	3⅛	3½	4¼	4¼	5	5¾	6½	6½	7	7½	8
Center to Bottom Flange	2¼	2¾	3⅛	3½	4⅜	4⅜	5	5½	6¼	6½	7	7½	8
Extreme Height		19	19¾	24	28	28	29¼	33	34	39	40	44	46
Center to End of Shaft		10½	10½	13½	16	16	16	19	19	21	21	24	24
Diameter of Pulley		2	2	2½	3	3	3	3½	3½	4	4	5	5
Width of Belt		1½	1½	1½	2	2	2	2	2	2½	2½	2½	2½
No. of Revolutions	600	600	600	550	500	500	500	400	400	350	350	300	300
Wt. of Governor (net)	15	17	19	31	52	55	57	87	100	135	150	175	200
Diameter Cylinder: 300 feet Piston Speed	4	5	6	7	9	10	12	14	16	18	20	22	26
Diameter Cylinder: 400 feet Piston Speed	3	4	5	6	8	9	10	12	14	16	18	20	23
Diameter Cylinder: 500 feet Piston Speed		3½	4½	5	7	8	9	10	12	14	16	18	21
Diameter Cylinder: 600 feet Piston Speed			4	4½	6	7	8	9	11	13	15	16	19

All sizes up to 4-inch carried in stock.

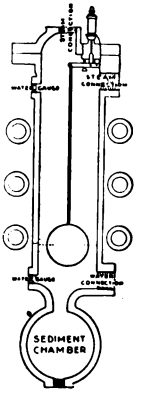
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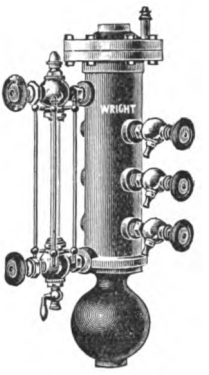
THE WRIGHT

IMPROVED SAFETY ALARM WATER COLUMNS.

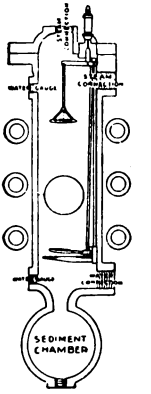
ECONOMY OF FUEL AND REPAIRS SAFETY TO LIFE AND PROPERTY.

Low Water Alarm.





Combined High and Low Water Alarms.



It is well understood that keeping the water in boilers steady at the proper level insures great economy in fuel. It should also be remembered that when the water is kept steady the boiler is not racked and strained as a result of fluctuations in temperature and pressure, consequently will last longer and need fewer repairs. Dry steam and steady steam pressure are other advantages that follow the use of these columns. They are furnished in two general styles, viz., low water alarm only and combined high and low water alarm. Send for special Wright catalogue.

PRICE LIST.

COMBINED HIGH AND LOW WATER ALARMS.

Size of Column.	Kind and Size of Boiler.	Variation Between Alarms.	List Price of Columns Without Water Gauge and Gauge Cocks.	Prices of Water Gauges and Gauge Cocks will be furnished upon application.
1	36 to 54 inches	6 inches	$28.00	
5	56 to 72 inches	8 inches	30.00	
7	Water Tube	12 inches	35.00	
9	Others determined by natural variation of water in boiler	18 inches	40.00	
11		24 inches	42.50	
13		30 inches	45.00	
15	See Note	36 inches	50.00	
	LOW WATER ALARMS.			
2	36 to 54 inches		$25.00	
6	56 to 72 inches		28.00	
8	Water Tube		35.00	

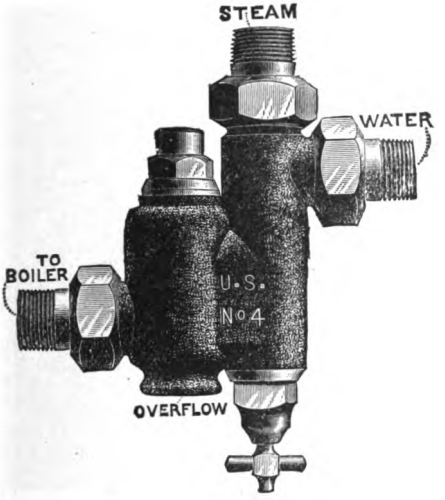
NOTE.—The size of the column is in all cases determined by the natural variation of the water in the boiler on which it is to be used. No mistake will be made ordinarily by selecting one of our columns, having the extreme gauge cocks the same distance apart as on the plain column furnished with boiler.

IMPORTANT To avoid mistakes, when ordering, please note that combined high and low water alarms are designated by ODD numbers, and low water alarms by EVEN numbers. All working parts are attached to the cap and are removed when the cap is removed. No expert or special tools are needed to repair these columns.

Provision is made for gauge cocks on either side of all these columns. This does away with all trouble about right and left hand columns.

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U. S. AUTOMATIC INJECTOR



Size	All Pipe Connections	Capacity Gallons per hour Max.	Capacity Gallons per hour Min.	Horse Power	Price
00	¼ in.	36	15	1 to 4	$ 13.00
0	⅜ "	65	28	3 " 8	14.00
1	⅜ "	90	40	6 " 10	16.00
2	½ "	125	60	8 " 15	18.00
3	½ "	170	75	15 " 20	20.00
4	¾ "	250	125	20 " 30	25.00
5	¾ "	340	140	30 " 40	30.00
6	1 "	475	250	40 " 60	40.00
7	1 "	575	300	60 " 70	45.00
8	1¼ "	750	350	70 " 95	55.00
9	1¼ "	920	450	85 " 120	60.00
10	1½ "	1350	675	120 " 165	75.00
11	1½ "	1750	850	165 " 230	90.00
12	2 "	2275	1000	230 " 295	110.00
13	2 "	2820	1700	295 " 375	125.00
14	2 "	3400	1700	375 " 460	150.00
15	2½ "	3650	1800	460 " 500	175.00
16	2½ "	4000	1950	500 " 600	200.00

The capacity is tested on a four-foot lift with steam at 80 pounds. In ordering always bear in mind that longer lifts decrease capacity.

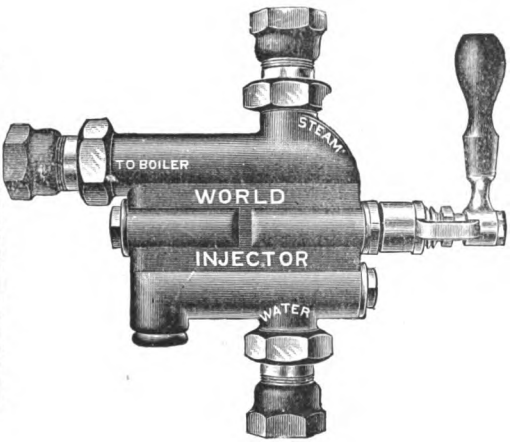
☞ Note that the United States has greater capacity, at maximum, than any other Injector of same price, and also that each size can be graded further than any other.

Do not be misled or persuaded into buying something else. You will regret it if you do. Remember your money will be refunded if the U. S. Injector does not give you perfect satisfaction.

☞ NOTE.—Traction Engine sizes: No. 2, 8 to 10; No. 3, 10 to 12: No. 4, 12 to 18; No. 5, 18 to 25 horse power.

THE WORLD AUTOMATIC INJECTOR

Size	Size of connections, Suction and Delivery	Size of Steam connection	80 Pounds Steam Pressure: Gallons per Hour	80 Pounds Steam Pressure: Horse Power	Price
30	½ in.	⅜ in.	120	10 to 15	$20.00
40	¾ "	½ "	220	15 to 25	25.00
50	¾ "	½ "	300	25 to 35	30.00
60	1 "	¾ "	420	35 to 50	40.00
70	1 "	¾ "	540	45 to 60	45.00
80	1¼ "	1 "	720	60 to 95	55.00
90	1¼ "	1 "	900	85 to 120	60.00
100	1½ "	1¼ "	1260	120 to 165	75.00
110	1½ "	1¼ "	1740	165 to 230	90.00
120	2 "	1½ "	2230	230 to 295	110.00
130	2 "	1½ "	2820	295 to 375	125.00
140	2 "	1½ "	3480	375 to 460	150.00
150	2½ "	2 "	3600	460 to 500	175.00
160	2½ "	2 "	4000	500 to 600	200.00



DIRECTIONS FOR OPERATING WORLD INJECTOR

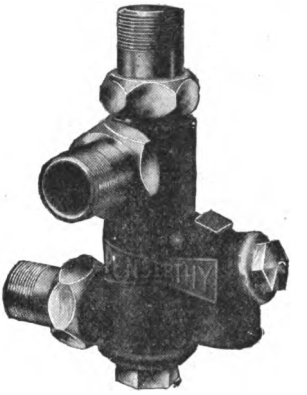
See that the injector is shut off when connected, the handle being turned as far to the right as it will go. Turn handle to the left one-quarter turn; when the water appears at the overflow, turn the handle slowly to the left as far as it will go and the injector will be working to the boiler.

If steam is high and lift long, the injector will lift the water better if the handle is turned a little less than a quarter of a turn, until water appears at overflow—then start to boiler as above.

If you have valves in steam and suction pipes, they must be open before you can start injector.

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PENBERTHY INJECTORS.



TRADE PENBERTHY MARK.

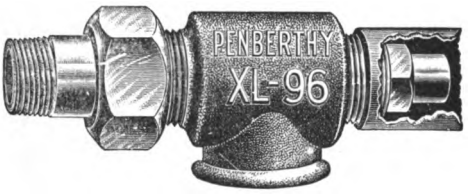
Start Low, 20 to 22 lbs. steam on 3-foot lift.
Work High, 157 to 165 lbs. steam on 3-foot lift.
Lift Water, 20 to 22 feet on 60 to 80 lbs. steam.
Handle Hot Water, 125° to 130° at 60 to 80 lbs. steam.
115° to 118° at 100 lbs. steam.
95° to 100° at 125 lbs. steam.

Size.	Price.	Horse Power Based on Ordinary Tub. Boiler	Horse Power Based on 30 lbs. Water per H. P. per Hour.	Pipe Connection.	Capacity per Hour, 1 to 3 feet lift, 60 to 85 lbs. Steam Pressure	
					Maximum.	Minimum.
O	$15 00	3 to 6	4 to 8	¼ inch.	60 gal.	40 gal.
OO	16 00	4 " 8	6 " 12	⅜ "	80 "	55 "
A	18 00	8 " 16	10 " 20	½ "	135 "	70 "
AA	20 00	12 " 22	15 " 30	½ "	180 "	100 "
B	25 00	17 " 32	22 " 45	¾ "	260 "	140 "
BB	30 00	20 " 45	25 " 60	¾ "	355 "	170 "
C	40 00	40 " 65	45 " 80	1 "	475 "	300 "
CC	45 00	45 " 80	50 " 100	1 "	600 "	350 "
D	55 00	50 " 100	60 " 135	1¼ "	800 "	425 "
DD	60 00	75 " 135	85 " 165	1¼ "	1,000 "	525 "
E	75 00	100 " 180	125 " 235	1½ "	1,400 "	800 "
EE	90 00	115 " 255	150 " 320	1½ "	1,900 "	900 "
F	110 00	160 " 320	200 " 400	2 "	2,400 "	1,300 "
FF	125 00	200 " 460	250 " 500	2 "	3,000 "	1,600 "
G	150 00	300 " 500	325 " 600	2½ "	3,600 "	2,000 "
GG	200 00	375 " 600	400 " 750	2½ "	4,200 "	2,500 "

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PENBERTHY

"XL-96" EJECTOR
SYPHON ON STEAM JET PUMP



NO LIABILITY OF GETTING OUT OF ORDER.
A COMPLETE STEAM PUMP AT SMALL COST.

The results obtained by the "XL-96" Ejector make it unquestionably the best device of its kind upon the market.

Heretofore, in order to obtain an elevation of liquids to 50 and 65 feet, the lifting power has been sacrificed, so that with every ejector on the market, the lifting power has been a second consideration, and in order to raise water 50 to 65 feet the ejector has to be placed near the water and high pressure carried. With the "XL-96" we lift water 20 feet with any steam pressure above 25 lbs. and 25 feet with pressure at 40 lbs. or over. On pressures above 80 lbs., steam must be throttled to get best results on a lift. Besides doing this we elevate 50 feet at 60 lbs. pressure, and 60 to 70 feet on pressures 80 to 100 lbs., 125 feet 180 lb. pressure, no lift, by placing the ejector within 12 to 18 inches of water supply.

It would be difficult to enumerate all the uses to which our Jet Pump is adapted, but when we say that anything and everything in the nature of a liquid, (if not too thick) can be transported from one level to another or horizontally almost any distance, we have about covered the ground; therefore the following factories, mills, etc., will see the advantage of adopting them, viz: Chemical works, creameries, cheese factories, tanneries, mines and quarries, well-diggers, brick yards, gas works, paper mills, steamboats, etc.

LIFTS 22 TO 25 FEET. ELEVATES 25 TO 125 FEET, ACCORDING TO PRESSURE.

PRICE LIST

Size Number	1	2	3	4	5	6	7*	8*	9*	10*
Price, all Brass.....each	$8 00	10 00	15 00	20 00	25 00	35 00	50 00	70 00	105 00	145 00
Price, Iron Body, Brass Jets.. "	1 to 4 made in Brass only				20 00	27 50	40 00	50 00	70 00	95 00
Pipe Connection, Steam.....	⅜	½	¾	1	1	1¼	1½	2	2	2½
" " Suction and Delivery	½	¾	1	1¼	1½	2	2½	3	3½	4
Capacity per Hour										
40 to 65 lbs. steam, 3-ft. lift gal.	240	500	840	1350	1950	3500	5700	9500	13600	18400
20 to 40 lbs. or 65 to 100 lbs..... "	235	450	700	1300	1850	3000	4350	8160	12400	17100
40 to 65 lbs, 50-ft. elevation..... "	120	250	420	650	975	1750	2500	4750	6800	9200
40 to 65 lbs. 25-ft. elevation..... "	180	375	625	950	1450	2600	3750	7200	10200	13800

PRICE LIST "XL-96" EJECTOR PARTS

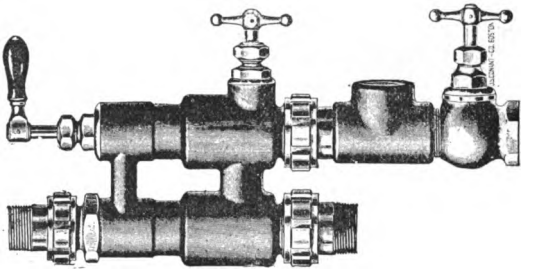
Size Number	1	2	3	4	5	6	7	8	9	10
Steam Jet.....	$ 25	35	45	55	60	80	1 00	1 25	1 50	2 00
Delivery Jet	80	1 00	1 25	1 50	1 75	2 50	4 00	6 00	8 00	10 00
Tail Pipe	25	30	40	50	50	60	80	1 00	1 00	1 25
Coupling Nut.....	25	30	40	50	50	60	1 25	1 50	1 50	2 00
Strainer	40	50	50	60	75	1 00				

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THE HANCOCK INSPIRATOR.

"STATIONARY" PATTERN.

FOR STATIONARY, MARINE AND PORTABLE BOILERS.

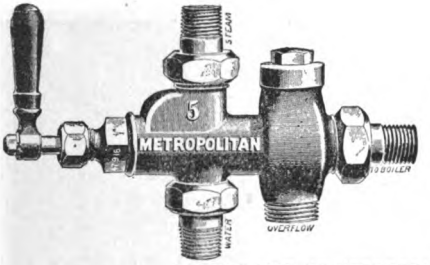


PRICES, CAPACITIES AND PIPE CONNECTIONS.

NOTE.—Capacities guaranteed to be actual as listed.

SIZES.	PRICES.	CAPACITIES PER HOUR.		PIPE CONNECTIONS.			
		WITH 60 LBS. STEAM PRESSURE AND 4 FT. LIFT.	HORSE POWER.	STEAM.	SUCTION.	DELIVERY.	OVERFLOW.
No. 7½	$16.00	60 gallons.	8	⅜	⅜	⅜	¼
" 8¾	18.00	90 "	12	⅜	½	½	⅜
" 10	20.00	120 "	16	⅜	½	½	⅜
" 12½	25.00	220 "	30	½	¾	¾	½
" 15	30.00	300 "	40	½	¾	¾	½
" 17½	40.00	420 "	56	¾	1	1	¾
" 20	45.00	540 "	72	¾	1	1	¾
" 22½	55.00	720 "	96	1	1¼	1¼	1
" 25	60.00	900 "	120	1	1¼	1¼	1
" 30	75.00	1,260 "	168	1¼	1½	1½	1¼
" 35	90.00	1,740 "	230	1¼	1½	1½	1¼
" 40	110.00	2,230 "	298	1½	2	2	1½
" 45	125.00	2,820 "	376	1½	2	2	1½
" 50	150.00	3,480 "	464	2	2½	2½	2
" 55	175.00	3,650 "	600	2	2½	2½	2

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THE METROPOLITAN AUTOMATIC INJECTOR.

The Metropolitan Automatic Injector is the result of combining in an Automatic Injector the correct principle, good mechanical design and perfect construction necessary to make a perfect Automatic Injector and in eliminating the weak features common in injectors of this type.

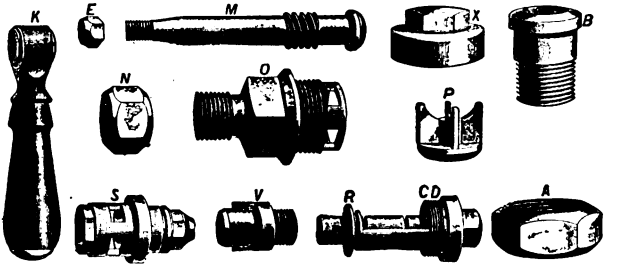
Correct Principle.—The Automatic Injector, sometimes called the single tube Injector, takes this name from the fact that one set of tubes are so arranged and proportioned that they lift as well as force the water, and are composed in a general way of a steam jet, suction or vacuum jet, combining and delivery tube, with the necessary valves to obtain the automatic feature.

PRICE LIST OF METROPOLITAN AUTOMATIC INJECTORS.

Sizes.	Prices.	Size of Pipe Connections.			Capacity with Steam Pressure 80 lbs. 4 foot lift.	Horse Power.
		Steam.	Suction.	Delivery.		
2	$15.00	⅜	⅜	⅜	60 gallons	4 to 6
3	16 00	⅜	⅜	⅜	80 "	6 to 8
3½	18.00	½	½	½	120 "	8 to 15
4	20.00	½	½	½	165 "	15 to 20
5	25.00	¾	¾	¾	250 "	20 to 30
6	30.00	¾	¾	¾	350 "	30 to 45
7	40.00	1	1	1	500 "	45 to 65
8	45.00	1	1	1	600 "	65 to 80
9	55.00	1¼	1¼	1¼	800 "	80 to 100
10	60.00	1¼	1¼	1¼	1000 "	100 to 130
11	75.00	1½	1½	1½	1300 "	130 to 170
12	90.00	1½	1½	1½	1750 "	170 to 230
13	110.00	2	2	2	2300 "	230 to 300
14	125.00	2	2	2	2850 "	300 to 375

The above capacity, based on 4-foot lift, 70 to 80 lbs. steam pressure; should lift be increased, capacity will be less. Horse power calculated on 7½ gallons of water to horse power.

PARTS OF METROPOLITAN AUTOMATIC INJECTOR.



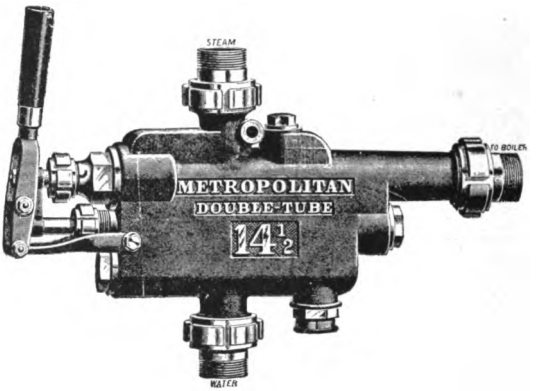
PRICE LIST METROPOLITAN AUTOMATIC INJECTOR PARTS.

Size of Injector..... No.	2--3	3½--4	5--6	7--8	9--10	11--12	13--14
S—Steam Jet..... Each	$1.50	1.75	2.00	2.50	3.75	5.00	7 00
V--Suction Jet..... "	.60	.70	.90	1.25	1.85	3.00	4.00
C-D-R—Combining and Delivery Tube and Auxiliary Check..... "	1.75	2 10	2.75	3.50	4.50	6.50	9.00
P—Overflow Valve..... "	.25	.50	.75	1.00	1.25	1.75	2.50
O--Steam Plug..... "	1.00	1.25	1.50	2.25	3.50	5.00	7.00
M--Steam Valve and Stem..... "	.40	.55	.75	1.10	1.75	2.50	4.00
N—Packing Nut..... "	.30	.40	.50	.65	.80	1.00	1.25
K--Steam Valve Handle..... "	.60	.70	.80	1.00	1.20	1.40	1.60
A—Coupling Nut..... "	.60	.80	1.20	1.65	2.40	3.20	5.00
R—Tail Pipe..... "	.40	.55	.80	1.20	1.70	2.40	3.40
X—Overflow Cap..... "	.50	.75	1.00	1 25	1.75	2.25	3.00
E—Nut for Stem M..... "	.10	.10	.10	.15	.15	.15	.20

In ordering parts, specify numbers of each part, calling same by name and letter above. Always state size number of Injector.

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THE METROPOLITAN DOUBLE-TUBE INJECTOR.



A perfect double-tube injector is one having the proportions of the tubes and the mechanical arrangements of the valves such as to obtain the greatest possible range (consistent with having the injector strong working and reliable), the working parts durable, easily operated, and without any outside connecting links to wear or become broken.

The Metropolitan Double-Tube Injector is a high grade injector designed for the severest of conditions.

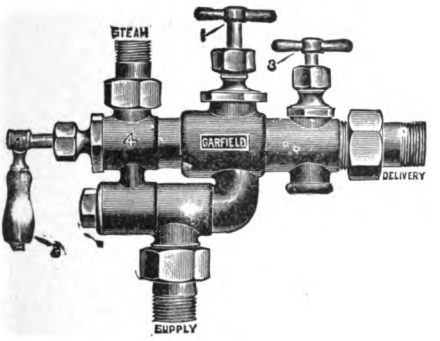
Owing to the positive closing over-flow valve in the delivery chamber of the forcing apparatus, the forcing combining tube can be made solid without any relief holes or spills, by the use of this kind of tube, together with the principle of the lifting tubes acting as a governor to the forcing tubes, the great range of this injector is obtained The fact that the Metropolitan Double-Tube Injector is capable of delivering water into the boiler as high as 300° Fahr. shows the wonderful results that can be accomplished.

Size.	Prices	Size of Pipe Connections			Capacity with 80 lbs. Steam Pressure, 2 foot lift.	Horse Power	Drip Funnel.
		Steam	Suction	Delivery			
2½	$18 00	½	½	½	120 gals	8 to 15	$1.00
4½	20 00	½	½	½	165 "	15 to 20	1.00
5½	25 00	¾	¾	¾	250 "	20 to 30	1.00
6½	30 00	¾	¾	¾	350 "	30 to 45	1.00
7½	40 00	1	1	1	500 "	45 to 65	1.00
8½	45 00	1	1	1	600 "	65 to 80	1.25
9½	55 00	1¼	1¼	1¼	800 "	80 to 100	1.25
10½	60 00	1¼	1¼	1¼	1000 "	100 to 130	1.25
11½	75 00	1½	1½	1½	1300 "	130 to 170	1.50
12½	90 00	1½	1½	1½	1750 "	170 to 230	1.50
13½	110 00	2	2	2	2300 "	230 to 300	1.75
14½	125 00	2	2	2	2850 "	300 to 375	1.75
15½	150 00	2½	2½	2½	3500 "	375 to 500	2.00
16½	200 00	2½	2½	2½	4200 "	500 to 650	2.00
17½	250 00	3	3	3	4700 "	650 to 775	2.50
18½	300 00	3	3	3	5500 "	775 to 950	2.50

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THE GARFIELD DOUBLE JET INJECTOR

No Movable Parts. No Adjustment for Varying Steam Pressure. Simple and Reliable. Durable.



The Garfield Double Jet Injector is especially adapted for severe conditions such as long lifts, handling hot feed water, varying steam pressure.

Number of Injector	Size of Connections: Steam	Size of Connections: Supply & Delivery	Steam Pressure 60 to 80 Pounds: Gals. per Hour	Steam Pressure 60 to 80 Pounds: Horse Power	PRICE
00	⅜	⅜	60	2 to 5	$ 16 00
0	⅜	½	90	5 to 10	18 00
1	⅜	½	120	10 to 15	20 00
2	½	¾	220	15 to 24	25 00
3	½	¾	300	24 to 35	30 00
4	¾	1	420	35 to 50	40 00
5	¾	1	540	50 to 65	45 00
6	1	1¼	720	65 to 90	55 00
7	1	1¼	900	90 to 115	60 00
8	1¼	1½	1200	115 to 150	75 00
9	1¼	1½	1700	150 to 200	90 00
10	1½	2	2200	200 to 275	110 00
11	1½	2	2800	275 to 350	125 00
12	2	2½	3400	350 to 425	150 00
13	2	2½	4000	425 to 500	180 00
14	2	2½	4500	500 to 600	200 00

These capacities are obtained by actual measurements on the following basis: Steam 60 to 80 pounds, lift 4 feet, and feed water 76 degrees Fahr. The actual capacities are in excess of the list, and fully equal to any of the same size, connections and price.

CHICAGO AUTOMATIC INJECTOR

Simplest construction, consisting of but three tubes, the body or shell, one check valve and bushings.

Will start low from 15 to 20 pounds steam pressure on 4-foot lift. Will work high to 135 to 145 pounds steam pressure. Will work on a 20 to 22-foot lift with 60 to 90 pounds steam pressure. Will grade 50 per cent, i. e., capacity reduced ½ before it will stop. Will work 120 to 125 degrees hot. Works equally well when taking water from a lift or under pressure.

Size	Pipe Connection	Capacity per Hour Maximum	H. P. Based on Ordinary Tubular Boiler	Price
00	⅜ in.	80	4 to 11	$ 16 00
0	½ in.	135	10 to 19	18 00
1	½ in.	180	15 to 24	20 00
2	¾ in.	260	18 to 34	25 00
3	¾ in.	355	20 to 47	30 00
4	1 in.	475	40 to 64	40 00
5	1 in.	600	45 to 80	45 00
6	1¼ in.	800	55 to 106	55 00
7	1¼ in.	1000	75 to 134	60 00
8	1½ in.	1400	100 to 181	75 00
9	1½ in.	1900	115 to 254	90 00
10	2 in.	2400	150 to 320	110 00
11	2 in.	3000	190 to 400	125 00
12	2½ in.	3600	275 to 480	150 00
13	2½ in.	4200	375 to 560	180 00
14	2½ in.	4500	400 to 600	200 00



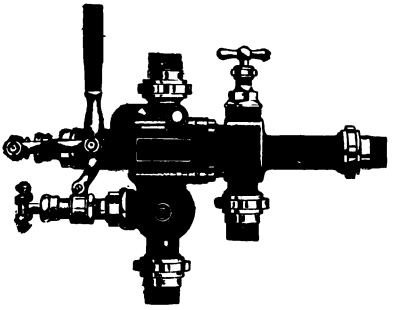
These capacities are obtained by actual measurements on the following basis:

Steam, 60 to 80 pounds. Lift, 1 to 3 feet. Feed water, 76 degrees Fahr.

When working from a 10-foot lift, the above capacities will be reduced about 10 per cent; from a 15-foot lift, 17 per cent.

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THE GARFIELD LOCOMOTIVE INJECTOR



FOR MARINE AND STATIONARY BOILERS

Range 35 to 200 lbs. Steam pressure. Overflow open or closed as ordered.

Should water supply be interrupted from any cause, it will instantly restart itself as soon as cause of interruption is removed.

Iron Pipe				Copper Pipe			Overflow	Capacities per H'R 140 Lbs. Steam	Price
Size	Steam	Supply	Delivery	Steam	Suction	Delivery	Iron Pipe		
3	¾	1	1	1	1⅛	1⅛	1	420 gals.	$ 50.00
4	1	1	1	1¼	1¼	1¼	1	550 "	60.00
5	1¼	1¼	1¼	1½	1½	1½	1¼	950 "	75.00
6	1¼	1¼	1¼	1½	1½	1½	1¼	1300 "	90.00
7	1½	1½	1½	1¾	1¾	1¾	1½	1800 "	110.00
8	1½	2	2	1¾	2¼	2¼	2	2300 "	125.00
9	1½	2	2	1¾	2¼	2¼	2	2900 "	140.00
10	2	2	2	2¼	2¼	2¼	2	3400 "	160.00

THE GARFIELD EJECTOR

For raising water from deep wells, mines or pits, filling or emptying tanks, raising and transferring liquids, hot or cold, in tanneries, dye houses, etc., it is not surpassed.

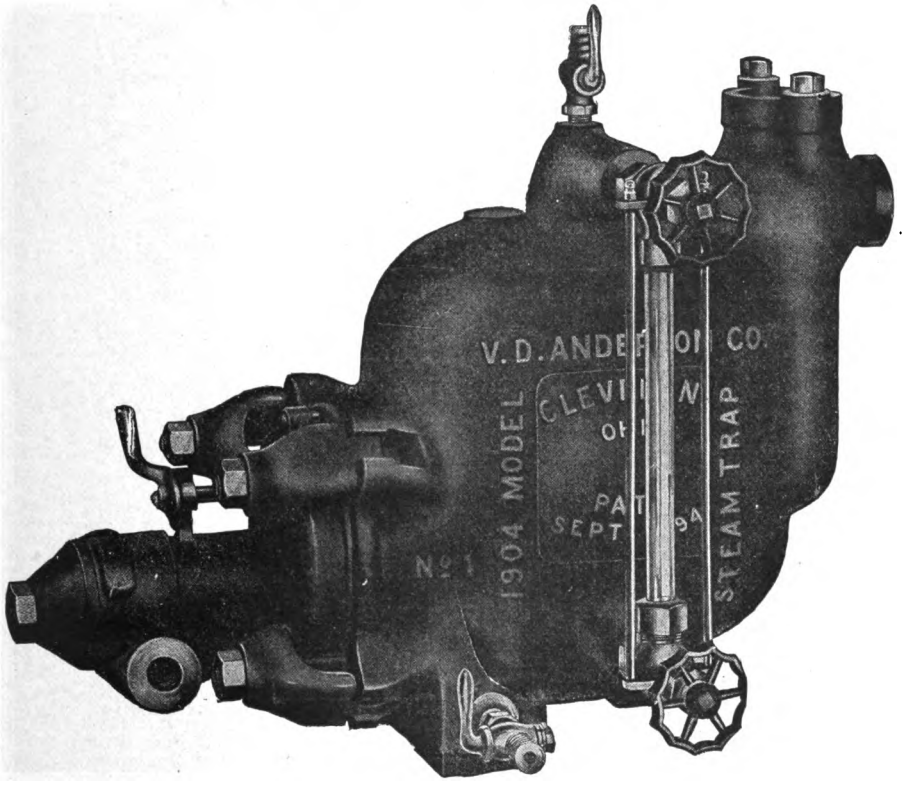
Almost anything and everything in the nature of a liquid (if not too thick) can be transported from one level to another, or horizontally, almost any distance. Factories, mills, mines, quarries, cheese factories, tanneries, etc., can readily see the advantage of adopting it in preference to a more expensive pump as it will in most cases, take its place and be just as effective and satisfactory. It is lighter and stronger, is not subject to derangement, and is always in working order.



Iron Pipe Connection				Capacity Gals. per hour	Diam. of Well in Inches	Price
No.	Steam	Suction	Delivery			
1	⅜ in.	¾ in.	½ in.	300	2¼ in.	$ 8.00
2	⅜ "	1 "	¾ "	500	2¾ "	10.00
3	½ "	1¼ "	1 "	800	3 "	15.00
4	¾ "	1½ "	1¼ "	1300	3½ "	20.00
5	1 "	2 "	1½ "	2000	4¼ "	25.00
6	1¼ "	2½ "	2 "	3000	5 "	35.00
7	1½ "	3 "	2½ "	5000	6 "	50.00
8	1¼ "	3 "	2½ "	6500	6 "	60.00

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THE ANDERSON STEAM TRAP



All parts readily accessible.

SIZES, CAPACITY, ETC.

Size Number of Trap	1	2	3	4	5	6	7
Size of Pipe connection, in inches	½	¾	1	1¼	1½	2	2½
Maximum discharge of condensation, per hour in pounds	750	1,200	2,000	2,800	4,000	6,000	12,000
Greatest number of square feet of surface that should be applied	500	800	1,300	2,350	3,500	5,000	10,000
Greatest number of lineal feet of 1-inch pipe surface that should be applied	1,500	2,500	4,000	7,000	10,000	15,000	30,000
Shipping weight, in pounds (boxed)	54	67	93	112	145	190	440
Price, $	20 50	22 50	28 00	35 00	50 00	70 00	120 00

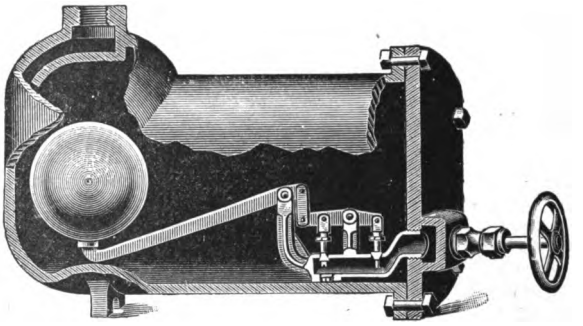
NOTE—Our Standard Trap will work at any pressure, from 150 pounds down, but for low pressure service we can furnish the trap with extra large valve outlet; hence in ordering, indicate approximate pressure under which trap is to be operated.

Every trap is carefully tested under pressure before leaving our factory.

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THE DAVIS STEAM TRAP

ADAPTED FOR HIGH, MEDIUM OR LOW PRESSURES



The Davis Steam Trap is a continuous flow trap designed for general service and suitable for use in connection with high, medium or low pressure. As will be seen from the sectional illustration, it is extremely simple in construction; all the working parts are attached direct to the cover, and may be removed without disconnecting the pipes. The valves, which control the discharge of the condensation, are perfectly balanced at every point of their throw, and are so constructed that the inevitable dirt, grit, and sediment which enters the trap will not interfere with its operation. These valves are operated by a seamless copper float, tested to 300 lbs. pressure, and the casing in which they work is made from high-grade steam metal. The inlet and outlet are of the same size, the latter being on the side shunted from the cover. A by-pass valve—which may be used at will—is provided in the cover. Each trap has a plugged drain hole in the bottom so that dirt, scale, or sediment which accumulates, can be removed without opening it. When it is required, this trap can be fitted with a water gauge at a slight additional cost, so that its operation may be observed.

PRICE LIST—DAVIS STEAM TRAP

Number	00	0	1	2	3	4	5	6
Inlet and Outlet.....inches	½	¾	1	1¼	1½	2	2½	3
Capacity, lineal ft. of 1-in. pipe.....	1,500	3,000	6,500	15,000	20,000	30,000	40,000	60,000
Length from connection to connection.....	7¼	9½	11	13	14¾	16	16	16
Height from connection to connection.....	7	8¼	9¾	10½	12	14¼	14¼	14¾
Weight.....	25	40	60	80	125	235	240	250
Price.....each	$15 00	$20 00	$30 00	$45 00	$60 00	$80 00	$100 00	$125 00

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STANDARD POP SAFETY VALVES.

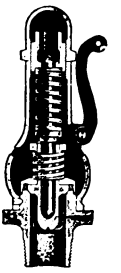
BRASS, SELF-ADJUSTING.

FOR STATIONARY OR MARINE BOILERS, PORTABLE FARM, HOISTING AND STEAM FIRE ENGINES.

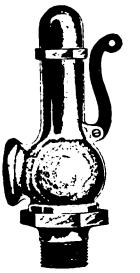
Having beveled seats at an angle of 45 degrees to its center line of axis, the lever is arranged to lift the valve off its seat one-eighth the diameter of the valve opening, according to the rules and regulations of the United States Board of Supervising Inspectors of Steam Vessels.

All springs are coiled, tempered and tested with greatest possible care.





WITH SIDE OUTLET.



PRICES AND DIMENSIONS.

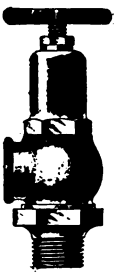
Size. Inches.	Size Steam Connections. Inches.	Height. Inches.	Largest Diameter. Inches.	For Boilers, H. P.	PRICE.	PRICE. Side Outlet.
¾	¾	6	2	3 to 6	$ 8.50	$10.00
1	1	7⅛	2¼	3 to 10	10.50	12.50
1¼	1¼	8½	2¾	10 to 20	13.00	15.50
1½	1½	9½	3⅜	20 to 30	16.00	19.00
2	2	11½	4	30 to 40	24.00	28.00

One-sixth turn of nut will change pressure of valve about five pounds either way.

In ordering, state pressure at which you wish valves set.

STANDARD WATER RELIEF VALVES.

BRASS.



These valves are similar in construction to Pop Safety Valves and are designed for the purpose of giving instantaneous and automatic relief to water chambers in water works, steam pumps, etc.

Size. Inches.	Size Steam Connections. Inches.	Height. Inches.	Largest Diameter. Inches.	PRICE.
¾	¾	6	2	$10.00
1	1	7⅛	2¼	12.50
1¼	1¼	8½	2¾	15.50
1½	1½	9½	3⅜	19.00
2	2	11½	4	28.00

In ordering, state highest working pressure.

To adjust for different pressures, loosen locknut, turn hand-wheel to right to increase pressure, turn hand-wheel to left to decrease pressure.

Made for wrench adjustment in place of hand-wheel when so ordered.

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LUNKENHEIMER STEAM WHISTLES

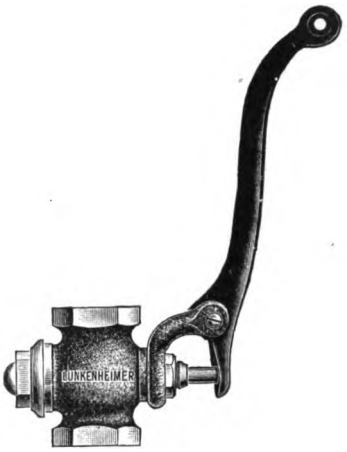
Whistle Valve

Without Valve



Brass with Valve





Diameter of Bells.....inches	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12
Size of Pipe Connection.....inches	¼	¼	⅜	½	¾	¾	1	1¼	1½	1½	2	2½	3
Brass Whistles without Valve.....each	2 20	2 75	3 00	4 35	5 25	7 25	9 50	12 00	19 00	24 00	70 00	150 00	290 00
Brass Whistles with Adjust Lever....each	3 10	3 75	4 00	5 50	6 50	8 50	11 50	15 00	22 50	33 00	95 00	210 00	320 00
Iron Base without Valve.....						5 50	7 25	10 00	16 00	23 00	55 00	125 00	250 00

WHISTLE VALVE

Size.....inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Brass.....each	2 00	2 00	2 50	3 00	3 50	5 00	6 00	9 00	18 00	27 00

Mocking Bird



MOCKING BIRD AND FIRE ALARM WHISTLES

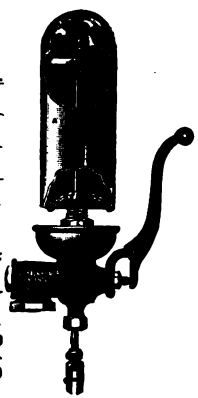
MOCKING BIRD WHISTLES

Diam.....in.	2½	3	3½	4	5	6
Size Pipe.....in.	½	¾	1	1¼	1½	1½
Brass with Valve	10 50	14 00	20 00	28 00	40 00	56 00
" without Valve	9 00	12 00	17 50	25 00	37 00	50 00

FIRE ALARM WHISTLES

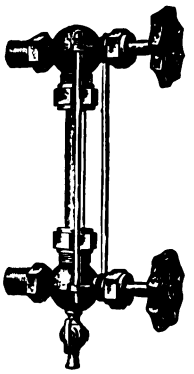
Diameter Bell.....inches	2½	3½	5	8
Size Pipe con.....inches	¾	1	1½	2
Iron Base with Valve.....	24 00	31 00	40 00	100 00
Brass Base with Valve.....	30 00	40 00	53 00	120 00

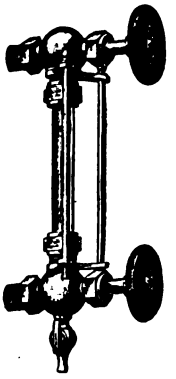
Fire Alarm

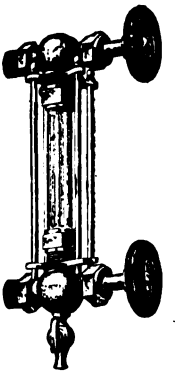


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WATER GAGES.







ROUGH BODY, TWO GUARDS, IRON WHEELS.

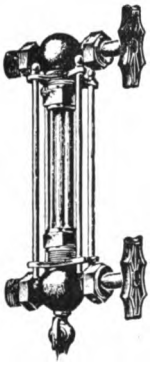
Screwed for ⅜	inch pipe, with glass	½ x 10	inches	Each	$2.75
" ½	" "	⅝ x 12	"	"	3.00
" ¾	" "	¾ x 16	"	"	4.50

FINISHED BODY, TWO GUARDS, WOOD WHEELS.

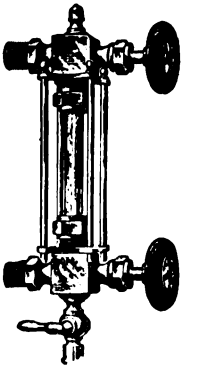
Screwed for ⅜	inch pipe, with glass	½ x 10	inches	Each	$3.75
" ½	" "	⅝ x 12	"	"	4.25
" ½	" "	⅝ x 12	" heavy pattern	"	7.00
" ¾	" "	¾ x 16	"	"	5.75
" ¾	" "	¾ x 16	" heavy pattern	"	8.00

FINISHED BODY, FOUR GUARDS, WOOD WHEELS.

Screwed for ½	inch pipe, with glass	⅝ x 12	inches	Each	$5.25
" ¾	" "	¾ x 16	"	"	6.00
" ¾	" "	¾ x 16	" heavy pattern	"	10.00



SELF CLEANING.



FINISHED BODY, FOUR GUARDS, IRON WHEELS.

Screwed for ½	inch pipe, with glass	⅝ x 12	inches	Each	$4.50
" ¾	" "	¾ x 16	"	"	5.25

FINISHED BODY, FOUR GUARDS, WOOD AND IRON WHEELS.

Screwed for ½	inch pipe, with glass	⅝ x 12	inches, wood wheels	Each	$6.00	Iron wheels	Each	$5.25
" ¾	" "	¾ x 16	" "	"	8.00	" "	"	7.50

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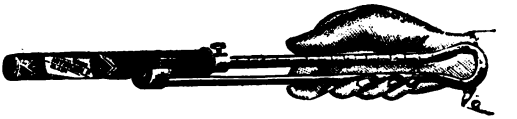


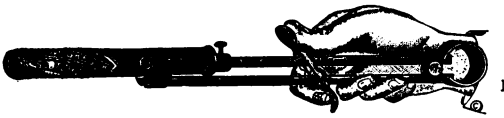
"FAVORITE" GLASS-TUBE CUTTER.

Price.....Each, $0.20

BROCTON GLASS-TUBE CUTTER.

Price.....Each, $1.50



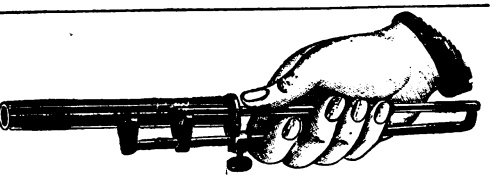


CHESTERTON'S GLASS-TUBE CUTTER.

Nickel Plated.....Each, $2.00

W. & C. GLASS-TUBE CUTTER.

Price.....Each, $1.50



SCOTCH GLASS TUBES.

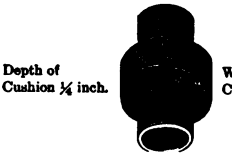


LENGTH.	EXTERNAL DIAMETER.			
INCHES.	⅛ and ¼	⅜	½	1 inch.
10	$3.00	3.60	5.04	6.12
11	3.24	3.96	5.64	6.72
12	3.60	4.32	6.12	7.32
13	3.84	4.80	6.60	7.92
14	4.20	5.16	7.08	8.52
15	4.44	5.52	7.56	9.12
16	4.80	5.88	8.16	9.72
17	5.04	6.24	8.64	10.32
18	5.40	6.60	9.12	10.92
19	5.64	7.08	9.60	11.52
20	6.00	7.44	10.20	12.12
22	6.60	8.16	11.16	13.44
24	7.20	8.88	12.12	14.64
30	9.00	11.16	15.24	18.24
36	10.80	13.44	18.24	21.96
48	14.52	18.00	24.36	29.16
60	18.12	22.56	30.48	36.48
72	21.84	27.12	36.48	43.80

60 x 1¼ inches, $60.00

These Gage Glasses are imported from Perth, Scotland, size labeled on end of each package, making them more desirable for stock. Each glass bears the above trade-mark. Lengths not regular, charged the price of next longer tubes of same diameter. Sizes over 24 inches special discount.

GILBERT'S SELF-PACKING GAGE GLASS PRESERVER.



No. 1 ½ inch, per box one dozen
No. 2 ⅝ inch, per box one dozen
No. 3 ¾ inch, per box one dozen
No. 4 1 or ¼ inch, per box one dozen
} Price, 60 cents per box.

COMMON RUBBER WASHERS.

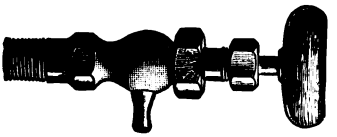
TO FIT GLASS TUBES FOR WATER GAGES.

SIZE.	Price per Dozen.
½ inch	$0.20
⅝ "	.25
¾ "	.30
⅞ "	.45
1 "	.65

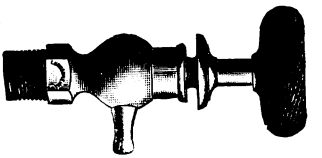
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GAUGE COCKS

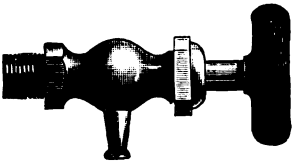
Regrinding Compression GAUGE COCK



Plain Soft Seat Compression GAUGE COCK



Soft Seat Compression GAUGE COCK (With Stuffing Box)



Ball GAUGE COCK



Number	C0	0	1	2	3	4
Cut for Pipe Thread.....inch	¼	⅜	½	¾	½	¾
Regrinding Compression Gauge Cock.....each	90	1 05	1 30	1 80		
Soft Seat Compression Gauge Cock.....each	80	90	1 00	1 10		
Soft Seat, with Stuffing-box.....each	1 00	1 10	1 20	1 30		
Ball Gauge Cock.....each					90	1 00

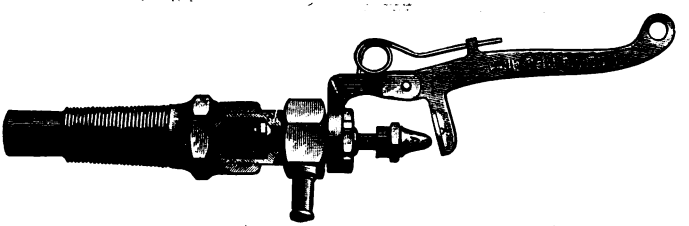
MISSISSIPPI GAUGE COCK



Number	1	2	4
Cut for Pipe Thread.....inch	⅜	½	¾
Price	75	1 00	1 50

SELF GRINDING ROTATING GAUGE COCKS

MADE WITH SHORT OR LONG SHANKS AND WITH OR WITHOUT LEVER

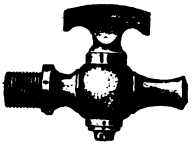


Size, Blank Shank.....inch	¾	1
Cut for Pipe Thread.....inch	½	¾
Finished Brass.....each	2 50	2 50

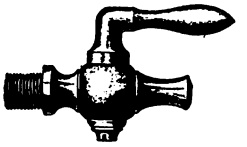
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AIR COCKS.

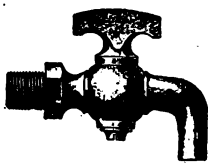
T. H. Single Thread



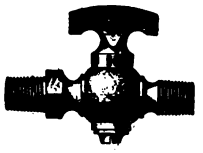
L. H. Single Thread.



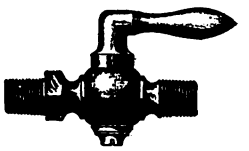
T. H. Single Thread, Bibb.



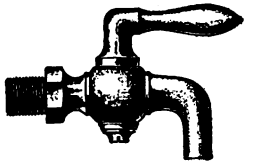
T. H. Double Thread, Male.



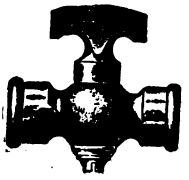
L. H. Double Thread, Male.



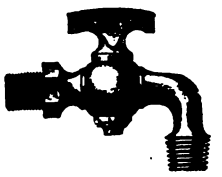
L. H. Single Thread, Bibb.



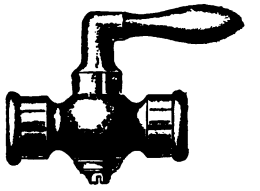
T. H. Double Thread, Female.



T. H. Double Thread, Bibb.



L. H. Double Thread, Female.

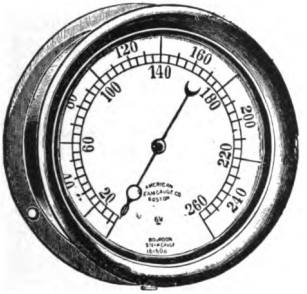


Size.....	⅛	¼	⅜	½
Tee handle, single thread	.40	.45	.50	.60
Tee handle, double thread, male.....	.55	.65	.75	.90
Tee handle, double thread, female.....	.65	.70	.85	
Tee handle, bibb, single thread.....	.70	.80	.90	1.00
Tee handle, bibb, double thread.....	.80	1.00	1.10	1.35
Lever handle, single thread	.55	.60	.65	.75
Lever handle, double thread, male	.70	.80	.90	1.05
Lever handle, double thread, female	.80	.85	1.00	
Lever handle, bibb, single thread.....	.85	.95	1.05	1.15
Lever handle, bibb, double thread	.95	1.15	1.25	1.50

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AMERICAN PRESSURE AND VACUUM GAUGES

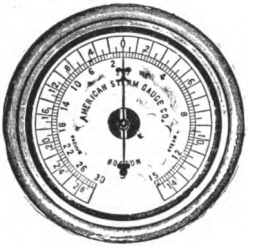
Pressure



Vacuum



Compound Pressure and Vacuum



These gauges are guaranteed to be of the very best quality, workmanship and material throughout. A siphon should be used in connecting all steam gauges.

PRICE LIST
SINGLE SPRING BOURDON PRESSURE OR VACUUM GAUGES

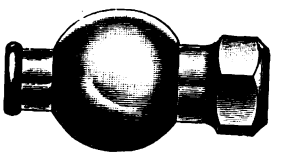
Size	Iron Case Brass Ring	Iron Case N. P. Ring	Brass Case	N. P. Case
12-inch dial	$50 00	$51 50	$75 00	$79 00
10 " "	32 00	33 00	40 00	43 00
8¼ " "	22 00	22 75	30 00	32 50
6¾ " "	16 00	16 60	20 00	22 00
6 " "	13 00	13 50	16 00	17 50
5½ " "	10 00	10 25	12 00	13 25
5 " "	8 00	8 20	11 00	12 00
4½ " "	8 00	8 20	10 00	11 00
3½ " "	7 00	7 18	9 00	9 75
3 " "	6 00	6 15	8 00	8 60
2½ " "	6 00	6 15	8 00	8 60

PRICE LIST
COMPOUND PRESSURE AND VACUUM GAUGES

Size	Iron Case Brass Ring	Iron Case N. P. Ring	Brass Case	N. P. Case
12-inch dial	$60 00	$61 50	$80 00	$84 00
10 " "	40 00	41 00	50 00	53 00
8½ " "	30 00	30 75	40 00	42 50
6¾ " "	20 00	20 60	25 00	27 00
6 " "	16 00	16 50	20 00	21 50
5½ " "	14 00	14 25	16 00	17 25
5 " "	14 00	14 25	16 00	17 25
4½ " "	12 00	12 20	14 00	15 00
3½ " "	10 00	10 18	12 00	12 75

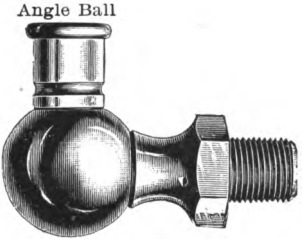
SIPHONS

Straight Ball





Angle Ball



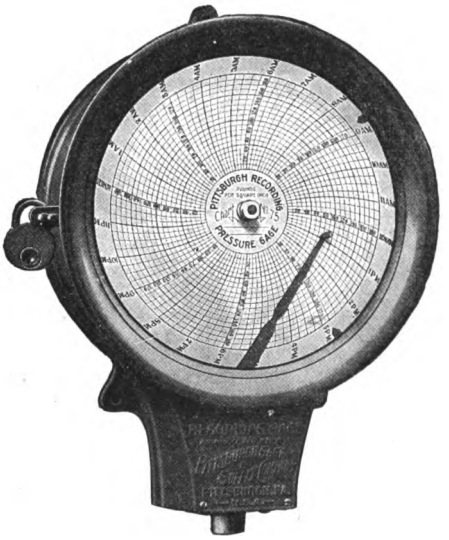
A siphon should be used in connecting each steam gauge. The ball siphon is not furnished for gauges larger than 6¾-inch dial.

	Iron	Brass	N. P.
Common Iron Pipe Siphon, ¼-inch	$0 25		
Common Brass Pipe Siphon		$1 00	$1 50
Straight Ball Siphon		1 00	1 50
Angle Ball Siphon		1 25	1 75

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PITTSBURGH RECORDING PRESSURE AND VACUUM GAGES.

Especially adapted for recording the pressure of Steam, Water, Oil, Gas or Air; also Vacuum. They accurately record upon a chart the exact condition of the pressure or vacuum prevailing at any hour or minute of the day or night.



This information is a valuable aid in promoting the efficiency of the plant. They are arbitrators of all disputes, their decision is just, impartial and unimpeachable.

It is a well known fact that the wear and tear on the Boiler—the strain of expansion and contraction, caused by fluctuations of the steam pressure—directly affect the life of the boiler, as well as its safety. Such fluctuations also directly concern the working efficiency of the engines—the entire plant—as the more uniform the pressure, the more and better the work done.

By making a permanent record of the slightest variation in the steam pressure, the Pittsburgh Recording Gage is an ever present guardian against carelessness—its written record is truthful always.

This Gage may be placed near the Boiler, or any distance therefrom—in the office, for instance—where every fluctuation may be observed instantly. The Pittsburgh Recording Gage complies with every requirement of the Mining Laws, and can be easily attached to Mine Fans to record either pressure or vacuum, or both.

Made of the best quality of Brass, highly polished and heavily Nickel-plated.

Shipped subject to trial, to be returned at our expense if not satisfactory in every way.

PRESSURE GAGES.

Chart No.	GRADUATIONS.	TOTAL SCALE	Chart No.	GRADUATIONS.	TOTAL SCALE
19	1-5 in. Head of Water	0 to 8 inches	74	5 lb. per sq. inch	0 to 150 lbs.
15	1 in. Head of Water	0 to 36 inches	75	10 lb. per sq. inch	0 to 180 lbs.
28	1 oz. per sq. inch	0 to 20 ounces	35	10 lb. per sq. inch	0 to 200 lbs.
29	1 oz. per sq. inch	0 to 36 ounces	30	10 lb. per sq. inch	0 to 350 lbs.
13	¼ lb. per sq. inch	0 to 6 lbs.	39	25 lb. per sq. inch	0 to 500 lbs.
91	½ lb. per sq. inch	0 to 12 lbs.	64	50 lb. per sq. inch	0 to 1000 lbs.
94	1 lb. per sq. inch	0 to 25 lbs.	26	50 lb. per sq. inch	0 to 1500 lbs.
88	2½ lb. per sq. inch	0 to 45 lbs.	203	100 lb. per sq. inch	0 to 4000 lbs.
81	2 lb. per sq. inch	0 to 90 lbs.			

VACUUM GAGES.

01	1-10 in. Head of Water	0 to 1 inch.	12	½ in. Head of Water	0 to 12 inches
02	1-10 in. Head of Water	0 to 2 inches.	93	1 in. Head of Mercury	0 to 30 inches
214	1-5 in. Head of Water	0 to 8 inches.			

COMBINATION VACUUM AND PRESSURE GAGES.

18	1-10 in. Head of Water	2 in. vacuum 4 in. pressure	54	Vac. in. Mercury and Pres. Lbs. per sq. in.	30 in. vacuum 50 lbs. pressure
303	1-5 in. Head of Water	3 in. vacuum 3 in. pressure	5	Vac. in. Mercury and Pres. Lbs. per sq. in.	30 in. vacuum 150 lbs. pressure
95	⅓ in. Head of Water	6 in. vacuum 6 in. pressure			

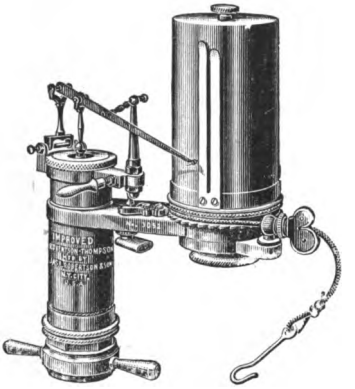
Charts 8 inches diameter. One complete revolution of chart every 24 hours.

LIST PRICE, including Lock and Key, Union Cock, Ink and 100 Charts, $50.00 each.

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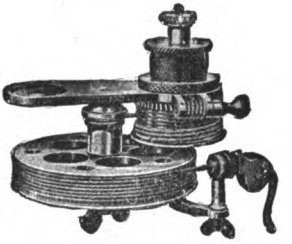
THE ROBERTSON-THOMPSON INDICATOR

PRICE COMPLETE, $60.00



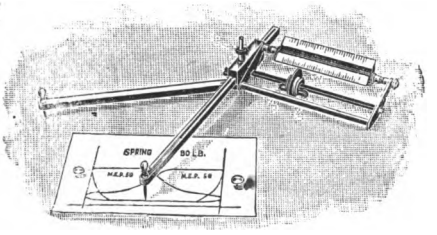
A strictly high grade Indicator. No complicated parts to give trouble. Correct springs, up-to-date in every particular and fully guaranteed.

VICTOR REDUCING WHEEL



Will fit any Indicator, and is furnished complete with full set of bushings for all stroke engines. It is light, strongly made and always ready for use.
Price, complete..... $15.00

IMPROVED WILLIS PLANIMETER

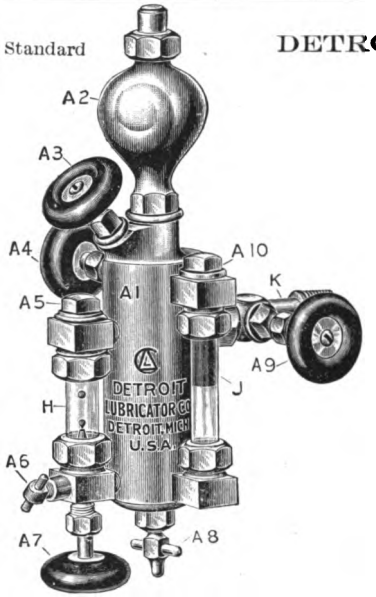


Reads M. E. P. and Areas direct without any figuring. Easy to use and read and will be found very accurate and durable.
Price, complete..... $18.00

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DETROIT LUBRICATORS

Standard



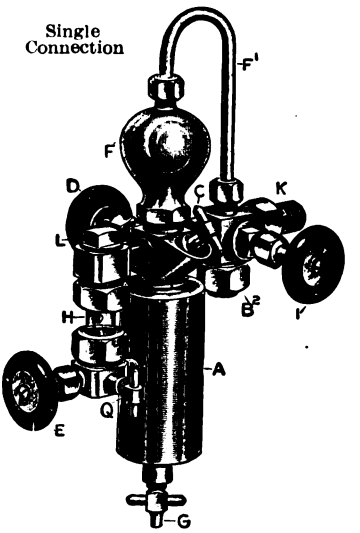
DETROIT STANDARD LUBRICATOR FOR STATIONARY ENGINES

DETROIT SINGLE CONNECTION LUBRICATOR

STYLE C

FOR TRACTION ENGINES, PORTABLE ENGINES, STEAM PUMPS, ETC.

Single Connection



PRICE LIST DETROIT STANDARD LUBRICATOR

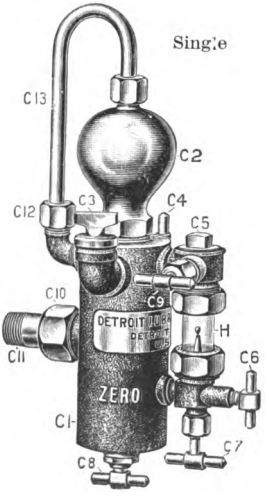
Size For Cylinder	¼ Pint Under 10 in.	½ Pint 10 to 12 in.	1 Pint 12 to 18 in.	1 Quart 18 to 30 in.	½ Gal. 30 in. & Over	1 Gal.
Brass Finish	$17 00	22 00	30 00	45 00	60 00	75 00
Nickel Finish	20 00	25 00	35 00	50 00	65 00	80 00
Pipe Thread on Support Arm..Inches	½	½	½	½	¾	¾

SIZES OF GLASSES USED

Sight Feed	⅝ x 2 1-16	¾ x 3	¾ x 3	⅞ x 3½	⅞ x 3½	⅞ x 3½
Gauge	⅝ x 2 1-16	⅝ x 3½	⅝ x 4⅜	⅝ x 4⅜	¾ x 6	¾ x 7¾

PRICE LIST SINGLE CONNECTION LUBRICATOR

Size	¼ Pint	½ Pint	½ Pint	Pint	Quart
Brass Finish....Each	$15 00	17 00	20 00	28 00	42 00
Nickel Plated.... "	18 00	20 00	23 00	32 00	47 00
Pipe Thread on Support Arm....Inches	½	½	½	½	½



DETROIT "ZERO" SINGLE AND DOUBLE CONNECTION LUBRICATORS

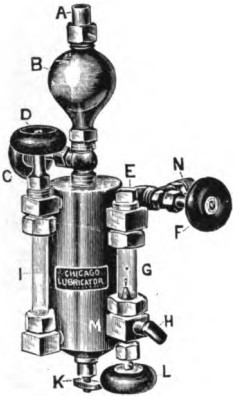
For traction engine service or engines in exposed places subject to sudden changes in temperature.

PRICE LIST SINGLE AND DOUBLE CONNECTION ZERO LUBRICATORS

Size	¼ Pint	½ Pint	½ Pint	Pint	Quart
Bronze Body, Finished Trimmings	$15 00	17 00	20 00	28 00	42 00
Nickel Plated, all over	18 00	20 00	23 00	32 00	47 00
Pipe Thread on Support Arm, Single Connection..Inches	½	½	½	½	½
Pipe Thread on Support Arm, Double Connection..Inches	⅜	⅜	⅜	½	½

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THE CHICAGO DOUBLE CONNECTION SIGHT-FEED LUBRICATOR



FOR STATIONARY ENGINES

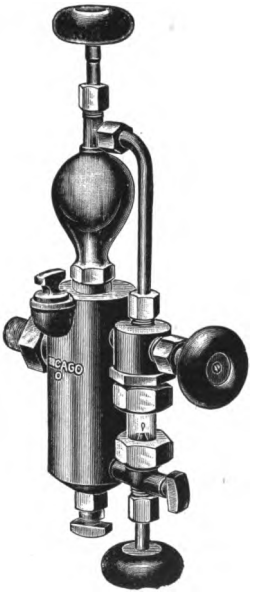
Size	⅓ Pt.	½ Pt.	1 Pt.	1 Qt.	½ Gal.
For Cylinder	Under 10"	10 to 12"	12 to 18"	18 to 30"	30" and over.
Brass Finish	$17.00	$22.00	$30.00	$45.00	$60.00
Nickel Finish	20.00	25.00	35.00	50.00	65.00
Pipe Thread on Support Arm	½ in.	½ in.	½ in.	½ in.	¾ in.

SIZES OF GLASSES USED

Sight-Feed	¼ x 2	¾ x 3	¾ x 3	¾ x 3	¾ x 3
Gauge	⅜ x 2	⅜ x 2	⅝ x 4	⅝ x 4	⅜ x 6

THE CHICAGO CLASS "O" SINGLE CONNECTION LUBRICATOR

FOR STATIONARY AND TRACTION ENGINES, STEAM PUMPS, AIR COMPRESSORS AND ALL CLASSES OF STEAM CYLINDERS



This is a medium-priced lubricator, thoroughly reliable under the adverse conditions now found in pump, stationary and traction engine service. It is strongly made of the best steam metal, and is extremely simple in construction, having few parts, all of which are easily accessible for cleaning or repair.

It will feed the heaviest oils even when exposed to the severest weather, and when once adjusted will feed regularly down to the last drop, no matter whether the engine is working light or heavily loaded.

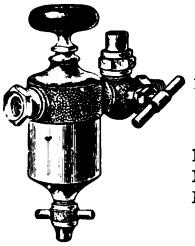
Size	¼ Pt.	⅓ Pt.	½ Pt.	1 Pt.	1 Qt.
Brass Finish	$15.00	$17.00	$20.00	$28.00	$42.00
Nickel Finish	18.00	20.00	23.00	32.00	47.00
Pipe Thread	½ in.	½ in.	½ in.	½ in.	½ in.

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"SWIFT" LUBRICATORS AND OIL PUMPS

"SWIFT" DOUBLE CONNECTION SIGHT-FEED LUBRICATOR

CLASS F.



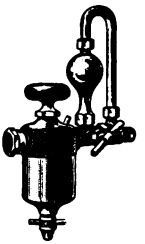
Will work the heaviest oil in the coldest weather. Range of feed is wide—from one drop oil per minute to one drop per second.

Capacity	¼ Pt.	⅓ Pt.	½ Pt.	1 Pt.	1½ Pt.	1 Qt.
Brass Finish	$2 75	$3 00	$3 25	$4 65	$5 40	$6 15
Nickel Plated	3 15	3 40	3 65	5 30	6 05	6 80
Pipe Thread	⅜"	⅜"	⅜"	½"	½"	½"

"SWIFT" SINGLE CONNECTION SIGHT-FEED LUBRICATOR

CLASS F. S. C.

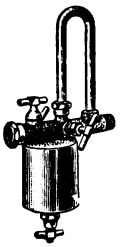
Used on threshing, portable, and stationary engines, steam pumps, etc. Designed for use where it is desirable to attach only one connection to steam pipe.



Capacity	¼ Pt.	⅓ Pt.	½ Pt.	1 Pt.	1½ Pt.	1 Qt
Brass Finish	$3 50	$3 75	$4 00	$6 00	$6 75	$7 50
Nickel Plated	3 90	4 15	4 40	6 65	7 40	8 15
Pipe Thread	⅜"	⅜"	⅜"	½"	½	½"

"SWIFT" SINGLE CONNECTION SIGHT-FEED LUBRICATOR

CLASS G.



This style of lubricator has been placed upon the market in answer to the request of many builders of small engines and steam pumps, etc., who desire a sight-feed cup that shall be low in price, and at the same time reliable in its action.

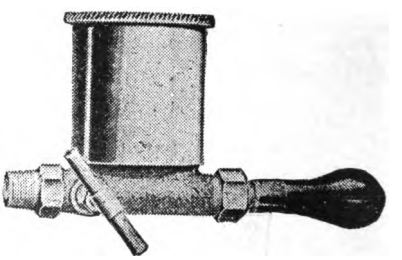
The lubricator is all cast in one piece so there are no joints for leakage, has a positive sight-feed, and is the only low-priced lubricator on the market with an index which notifies the engineer before the cup needs refilling.

Capacity	¼ Pt.	⅓ Pt.	½ Pt.
Brass Finish	$2 15	$2 50	$2 90
Nickel Plated	2 50	2 85	3 25
Pipe Thread	¼"	⅜"	⅜"

"SWIFT" CYLINDER OIL PUMPS

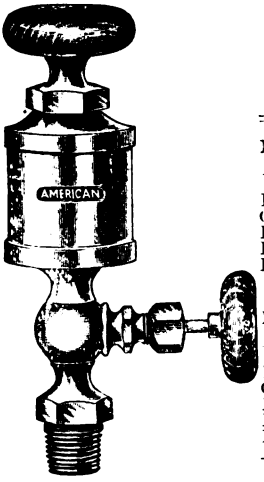
All sizes of this pump are provided with valves to shut off steam pressure, and this *without extra expense.*

This oil pump is not intended to take the place of a sight-feed lubricator, but to be used in case of emergency.



No. of Pump	1	2	3
Capacity	⅓ Pt.	½ Pt.	1 Pt.
Brass Finish	$3 25	$4 00	$5 50
Nickel Plated	3 60	4 40	6 00
Pipe Threads	⅜"	⅜"	½"

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PLAIN BRASS LUBRICATOR

FOR SMALL ENGINES AND STEAM PUMPS

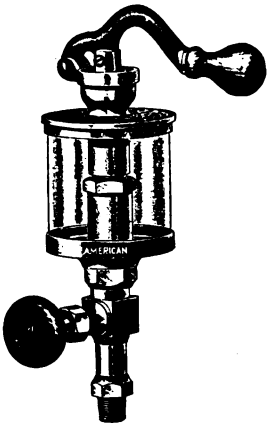
Number	00	0	1	2	3
Diameter Inches	1	1¼	1½	1¾	2
Capacity Ounces	¾	1	1¼	1½	2¼
Pipe Thread Inch	⅜	⅜	⅜	½	½
Plain Each	$2 00	2 20	2 40	2 60	2 90
Plain, with Cock and Tube "	3 00	3 20	3 40	3 60	3 90

Number	4	5	6	7	8
Diameter Inches	2¼	2½	3	3½	4
Capacity Ounces	4	5	10	18	24
Pipe Thread Inch	½	½	¾	¾	¾
Plain Each	$3 25	3 75	4 75	7 00	10 00
Plain, with Cock and Tube "	4 25	4 75	5 75	8 00	11 00

LOOSE PULLEY OILER

Number	00	0	1	2	3	4	5
Diam. of Body .. Inches	⅞	1	1¼	1½	1¾	2	2¼
Capacity Ounces	⅜	½	½	¾	1¼	1¾	2
Shank Pipe Thread, Inch	⅜	⅜	¼	¼	¼	⅜	⅜
Rough Brass Each	$0 20	25	30	40	50	65	85



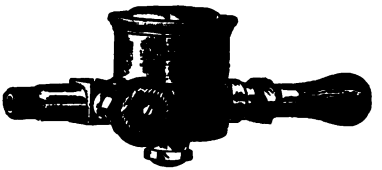


GLASS BODY OIL PUMPS

Number	4	5	6	7
Outside Diameter of Glass .. Inches	2½	3	3½	4½
Height of Glass "	2¾	3	4	5
Capacity	½ Pint	½ Pint	1 Pint	1 Qt.
Shank Pipe Thread Inch	⅜	⅜	½	½
Finished Brass Each	$6 75	8 50	10 00	13 50

ALL BRASS OIL PUMPS

Number	0	1	2	3	4
Outside Diam Inches	1½	1½	2	2½	3
Shank Pipe Thread .. Inch	¼	¼	⅜	½	½
Capacity (Grease), Ounces	1	1½	3	6	10
Finished Brass Each	$1 20	1 60	2 00	2 80	4 00
Nickel Plated "	1 45	1 90	2 40	3 40	4 75



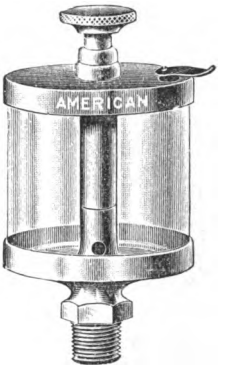
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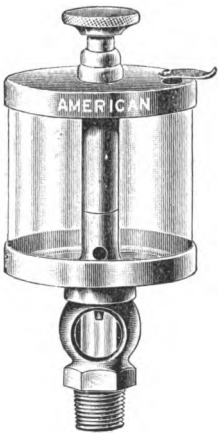
PLAIN BRASS OIL CUP

Number	00	0	1	2	3	4	5	6	7	8	9
Outside Diameter Inch	5/8	3/4	7/8	1	1 1/8	1 1/2	1 3/4	1 7/8	2	2 1/4	2 1/2
Shank Pipe Thread.. "	1/8	1/8	1/8	1/4	1/4	3/8	3/8	3/8	1/2	1/2	1/2
Plain Finished Brass "	$0 25	30	35	40	60	90	1 25	1 60	1 75	2 25	2 75

"PEARL" GLASS BODY OIL CUP

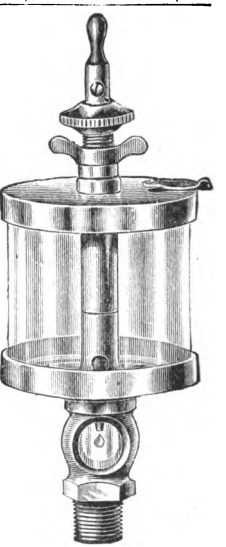


Number	000	00	0	1	1½	2	3	4	5	6	7
Outside Diameter of Glass.....Inches	1	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/2	2 1/2	3	3 1/2	4 1/4
Height of Glass.... "	7/8	1	1 1/8	1 3/8	1 5/8	1 7/8	2 1/8	2 3/8	3	4	5
Capacity Ounces	1/4	1/2	5/8	1	1 1/2	2 1/2	4	5	10	18	Qt
Shank Pipe Thd....Inches	1/8	1/8	1/8	1/4	1/4	3/8	3/8	3/8	1/2	1/2	3/4
Finished Brass Each	$0 70	75	80	1 00	1 25	1 50	1 90	2 40	3 16	4 00	6 20



"SIGHT-FEED" GLASS OIL CUP

Number	0	1	1½	2	3	4	5	6	7
Outside Diameter of Glass ..Inches	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3	3 1/2	4 1/4
Height of Glass..... "	1 1/8	1 3/8	1 5/8	1 7/8	2 1/8	2 3/8	3	4	5
Capacity Ounces	5/8	1	1 1/2	2 1/2	4	5	10	18	Qt.
Shank Pipe Thread Inch	1/8	1/4	1/4	3/8	3/8	3/8	1/2	1/2	3/4
Finished Brass.....Each	$1 25	1 50	1 75	2 10	2 55	3 15	3 90	4 80	7 00



SNAP LEVER SIGHT-FEED GLASS OIL CUP

Number	0	1	1½	2	3	4	5	6	7
Outside Diam. of Glass....Inches	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3	3 1/2	4 1/4
Height of Glass..... "	1 1/8	1 3/8	1 5/8	1 7/8	2 1/8	2 3/8	3	4	5
Capacity Ounces	5/8	1	1 1/2	2 1/2	4	5	10	18	Qt.
Shank Pipe Thread Inch	1/8	1/4	1/4	3/8	3/8	3/8	1/2	1/2	3/4
Finished Brass Each	$3 00	3 25	3 50	3 75	4 25	5 25	7 25	9 25	13 00

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PLAIN BRASS GREASE CUP



Number	00	0	1	2	3	4
Inside Diameter...Inches	1	1¼	1½	2	2½	3
Shank Pipe Thread..Inch	⅛	¼	¼	⅜	½	½
Capacity (Grease), Ounces	½	¾	1	2	3½	5
Finished Brass.....Each	$0 70	90	1 15	1 50	2 15	2 90
Nickel Plated..... "	82	1 06	1 36	1 80	2 60	3 40

AUTOMATIC GREASE CUP



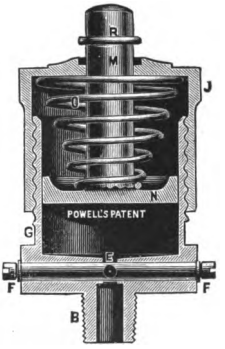
Number	00	0	1	2	3	4
Inside Diameter...Inches	1	1¼	1½	2	2½	3
Shank Pipe Thread..Inch	⅛	¼	¼	⅜	½	½
Capacity (Grease), Ounces	½	1	1½	3	6	10
Finished Brass.....Each	$1 50	2 00	2 50	3 20	4 30	6 00
Nickel Plated..... "	1 75	2 25	2 80	3 60	5 00	6 75



"NAVY" SCREW FEED GREASE CUP

Number	0	1	2	3	4
Inside Diameter.....Inches	1¼	1½	2	2½	3
Shank Pipe Thread.....Inch	¼	¼	⅜	½	½
Capacity (Grease).....Ounces	1	1½	3	6	10
Finished Brass.....Each	$1 20	1 60	2 00	2 80	4 00
Nickel Plated..... "	1 45	1 90	2 40	3 40	4 75

IMPROVED COMPRESSION GREASE CUP



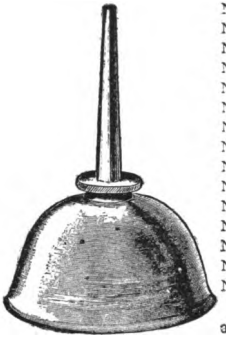
Number	00	0	1	2	3
Diameter of Cup.....Inches	1	1¼	1½	2	2½
Capacity.....Ounces	½	1	1½	3	4½
Size of Male Shank, Pipe Thread.....Inch	¼	¼	⅜	⅜ & ½	½
Size of Female Shank, Pipe Thread..... "	¼	¾	⅞	⅜ & ½	⅜
Painted.....Per dozen	$10 00	11 25	12 00	12 50	25 00

The above are of cast iron and especially adapted for use on overhead lines of shafting, countershafts, friction clutch pulleys, or wherever special finish is not required. Each filling of these cups should last from one to four weeks.

Can also be furnished with female thread instead of male.

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EVERLASTING BRAZED STEEL BENCH OILER.

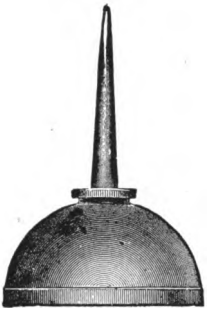


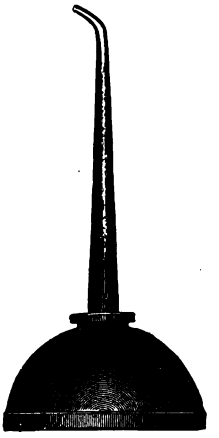
No. 100,	Brazed Steel Oiler,	2¾	inches diameter,	2½	inch Nozzle.....	Per Doz.	$4.00
No. 104,	" "	2¾	"	4	"	"	4.50
No. 204,	" "	3⅜	"	4	"	"	5.00
No. 206,	" "	3⅜	"	6	"	"	5.50
No. 209,	" "	3⅜	"	9	"	"	6.00
No. 304,	" "	3¾	"	4	"	"	6.00
No. 306,	" "	3¾	"	6	"	"	6.50
No. 309,	" "	3¾	"	9	"	"	7.00
No. 404,	" "	4⅛	"	4	"	"	7.00
No. 406,	" "	4⅛	"	6	"	"	7.50
No. 409,	" "	4⅛	"	9	"	"	8.00
No. 504,	" "	4⅝	"	4	"	"	8.00
No. 506,	" "	4⅝	"	6	"	"	8.50
No. 509,	" "	4⅝	"	9	"	"	9.00
No. 512,	" "	4⅝	"	12	"	"	9.00

Nozzle 6-inch and upwards furnished bent, unless otherwise ordered. All lengths are interchangeable.

COPPER PLATED STEEL OILERS.







										Per Doz.
No. 12	Steel Oiler,	3	oz.,	2⅜	in. diameter,	2½	in. nozzle,			$4 50
13	" "	5	"	3⅜	" "	3	" "			5 50
13A	" "	5	"	3⅜	" "	5	" "			6 00
14	" "	5		3⅜	" "	9	" "			6 50
14A	" "	½	pt.,	3¾	" "	3	" "			7 50
14AA	" "	½	"	3¾	" "	5	" "			8 00
14B	" "	½	"	3¾	" "	9	" "			8 50
15	" "	1	"	4¼	" "	3	" "			9 25
15A	" "	1	"	4¼	" "	5	" "			9 75
16	" "	1	"	4¼	" "	9	" "			10 50

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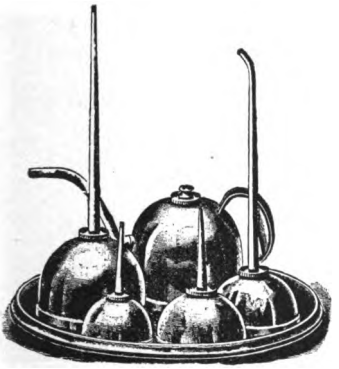
COPPER PLATED STEEL TALLOW POTS

No. 212. 1 Quart, 5 inch diameter, 5 inch high, bronzed.....per dozen, $21 00
No. 213. 2 Quart, 6 inch diameter, 6 inch high, bronzed.....per dozen, 25 00

COPPER PLATED ENGINEERS' FILLERS

No. 19. 1-pint Steel Fillers, Copper Plated, 4⅛ in. diam., 3½ in. high, Screw Top.....per dozen, $14 00
No. 19A. 1½-pint Steel Fillers, Copper Plated, 4¾ in. diam., 4 in. high, Screw Top.....per dozen, 17 00
No. 210. 1-quart Steel Fillers, Copper Plated, 5 in. diam., 5 in. high, Screw Top.....per dozen, 20 00
No. 211. 2-quart Steel Fillers, Copper Plated, 6 in. diam., 6 in. high, Screw Top.....per dozen, 24 00





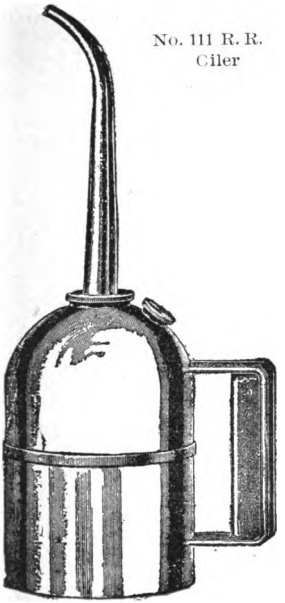
ENGINEERS' SETS

WITH ROUND TRAY

No. 30. Five Pieces of Brass (including Tray).$ 6 00
" 40. Six " " " " " 9 00
" 50. Five " of Nickel, " " 8 00
" 60. Six " " " " 11 00

STEEL RAILROAD OILERS

These Railroad Oilers are of the regular standard sizes and patterns used on all railroads.



No. 111 R. R. Oiler

They are made of two heavy steel seamless drawn parts, with large nozzle 1½ in. at base, 10 in. to 14 in. in length.

They are especially adapted for Locomotive and Stationary Engines.



No. 10 R. R. Oiler

COPPER PLATED STEEL RAILROAD OILERS

No. 10. 1-pint Railroad Oilers, 3⅜ in. diameter, 5 in. high, 12 in. nozzle.....per doz., $14 00

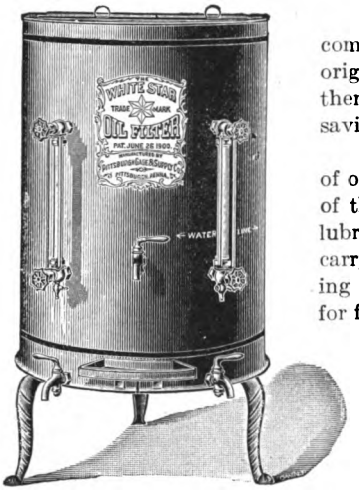
No. 11. 1-quart Railroad Oiler, 4⅛ in. diameter, 6 in. high, 18 in. nozzle.....per doz., 18 00

No. 111. 2-qt. Railroad Oiler, 5 in. diameter, 8 in. high, 10 or 14 in. nozzle....per doz., 20 00

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THE WHITE STAR OIL FILTER

ROUND TYPE



The cost of a White Star Oil Filter is so small in comparison to the savings effected by its use that the original investment is repaid within a few weeks, and thenceforth the oil economy continues as a large net saving in operative expense in any power plant.

Perfect lubrication requires that a copious supply of oil be fed to the bearings. Only a small percentage of the total oil fed is actually worn out in the work of lubrication; the remainder passes away at the drips, carrying with it more or less dirt or grit. By removing this foreign matter, the oil may be made suitable for feeding again to the bearings.

The White Star Oil Filter does its work of purifying dirty oil so that it may be used over and over in the bearings until actually worn out in the work of lubrication. With this filter in use the lubrication of bearings may be done much better than without it, inasmuch as the oil may be used more freely, knowing that none is wasted. Net reductions of from 50 to 75 per cent in oil bills are regularly effected upon installation of a White Star Oil Filter, the amount of saving depending upon the state of affairs before the filter is used and upon the extent to which advantage is taken of its presence afterward.

The White Star Oil Filter is built upon original lines and differs radically from all other filtering devices. All parts are readily accessible for examination and removable for cleaning so that it is easily kept in perfect condition for highest efficiency. The filtering medium is a specially prepared cloth wrapped around a perforated cylinder. This is a construction superior to any other in efficiency and simplicity.

PRICE LIST

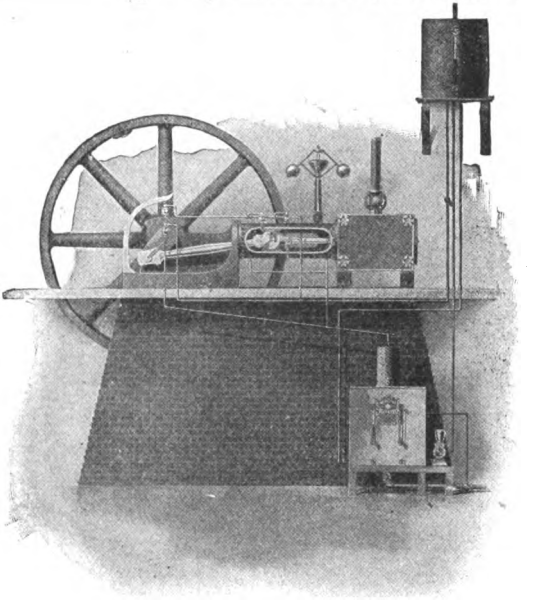
Number	Filtering Capacity—Gallons per Day	Capacity, Gallons				Dimensions		List
		Pure Oil	Dirty Oil	Water	Total Oil and Water	Diameter Inches	Total Height Inches	
2	20	12	4	4	20	16	34	$ 35 00
4	35	20	5	5	30	18	37	50 00
5	40	24	7	7	38	20	38	55 00
7	60	32	9	9	50	23	40	75 00
10	80	44	11	11	66	24	44	85 00
12	100	55	15	15	85	26	47	100 00
15	125	80	17	17	114	29	50	125 00

The filtering capacity of the White Star, under normal working conditions, always equals that given in the table, and is secured without pouring in dirty oil and drawing off the purified oil almost constantly, which is positively necessary in filters with smaller storage capacity.

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THE WHITE STAR CONTINUOUS OILING SYSTEM FOR POWER PLANTS

Is a mechanical system for handling the oil, feeding it to all the bearings, catching and filtering the drips and returning the purified oil to a reservoir for feeding again to the bearings. Thus the system is automatic and continuous in operation. The only handling of oil is when it is pumped from the barrel in which it is received to the overhead reservoir from which it is fed by gravity to the bearings and to which it is returned from the filter.



The system consists essentially of a reservoir of suitable capacity placed in convenient elevated position and connected by piping to such bearings as are to be lubricated. All drips are piped to a White Star Oil Filter of proper capacity. For large plants the filter is arranged in multiple units, not only to gain larger capacity but also to permit cleaning without interruption of complete operation. In the filter a three-fold separation is effected, the water draining away to the sewer and the purified oil returning through a pump to the reservoir overhead, leaving behind the dirt and other impurities, which are also drained away.

By use of the White Star Continuous Oiling system several advantages are secured:

1. Waste of oil is entirely eliminated. There is no handling of oil in hand oil cans or any loss in the system no matter how freely the oil is fed to the bearings.

2. The White Star Oil Filter thoroughly cleans the oil, removing all water and other foreign matter.

3. Every bearing is supplied positively with a steady flow of oil, which may be regulated for each individual bearing so as to give a drop by drop feed or a copious flood.

4. Ordinary lubrication difficulties are eliminated by the reliable operation of the system, which requires no attention other than to observe occasionally that the oil is feeding properly to the several bearings.

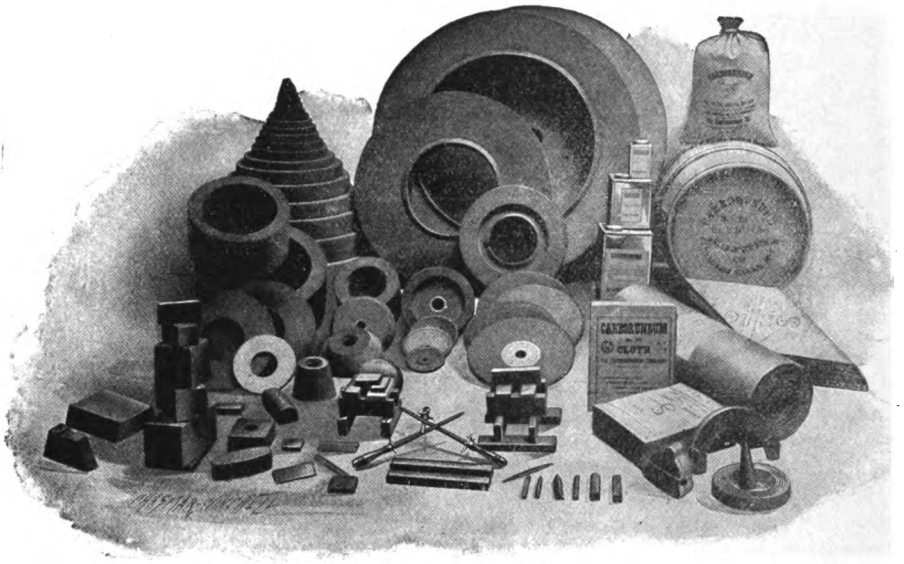
5. A barrel of oil in this system will do the work of two barrels in hand-oiling, and give much better results.

6. Any number of engines, pumps or power units using a like grade of oil may be connected to the same system.

Further information will be supplied upon application. In writing for estimates, state horse-power, number and type of engines, also the number of gallons of oil used per day.

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CARBORUNDUM.



ITS CHARACTERISTICS.

HARDNESS—Diamond is the only material exceeding it in hardness. It cuts emery and corundum with ease.

BRITTLENESS—Not as tough as the diamond, closely resembling corundum in this respect.

WEIGHT—Its specific gravity is 3.12. It is a little more than one and one-fifth times the weight of sand. One pound of carborundum is equal in volume to 1¼ pounds of emery.

INFUSIBILITY—Infusible at the highest attainable heat. Decomposition occurs in the electric arc.

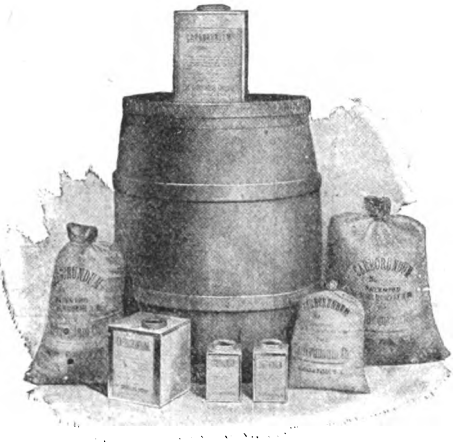
INSOLUBILITY—It is insoluble in any of the ordinary solvents. Water, oils, and acids have no effect upon it, not even hydrofluoric acid, which readily dissolves sand.

CHEMICAL COMPOSITION—It is composed of carbon and silicon in equal atomic proportions, and by weight thirty parts carbon to seventy parts silicon. Its chemical formula is SiC.

COLOR—Pure carborundum is white. In the commercial manufacture the crystals are produced in many colors and shades, partly as the result of impurities, and partly owing to surface oxidation. The prevailing colors are green, black, and blue. The color has no effect upon its hardness.

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CARBORUNDUM—CONTINUED.



Crude carborundum, as taken from the electric furnace, usually consists of large masses or aggregations of crystals. Very frequently these crystals are exceedingly beautiful in color and of brilliant adamantine luster. They form a very effective and attractive material for decorative work, particularly for show cases and window displays.

Grain carborundum is produced by crushing and grinding the crude, treating with acids and separating by sieves into various sized grains. These are numbered, the same as emery, in accordance with the number of threads per lineal inch of the sieve through which they have passed. Thus, No. 50 is a grain that has passed through a sieve having fifty threads to the inch, but would not pass through one having sixty threads. We prepare and carry in stock the following numbers: 6, 8, 10, 12, 14, 16, 20, 24, 30, 36, 40, 50, 60, 70, 80, 90, 100, 120, 150, 180, 220.

Powders are the particles or grains too fine to size by ordinary sieving. They are graded by floating in water or other liquid.

F, FF, FFF powders are graded in a stream of flowing water. They include in their numbers all grades of fineness from F, the next finest after No. 220, to FFF, which contains the very finest dust.

PRICES.

CRUDE CARBORUNDUM CRYSTALS SELECTED.

	Per Pound
Any quantity, carefully packed	$0.50

GRAINS, Nos. 6 TO 220, INCLUSIVE.*

One-half keg (150 pounds) or more (excepting Nos. 90, 100, and 120) of one number	.10
Fifty to 150 pounds of one number	.12
Five to 50 pounds of one number	.15
One, two, three, and five pounds, in tin cans, of one number	.17

F, FF, FFF POWDERS.

One-half keg (150 pounds) or more of one number	.08
Fifty to 150 pounds of one number	.09
Five to 50 pounds of one number	.10
One, two, three, and five pounds, in tin cans, of one number	.12

* The price of Nos. 90, 100, and 120, in any quantity greater than 50 pounds, is 12 cents per pound

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PRICE LIST OF REGULAR CARBORUNDUM WHEELS.

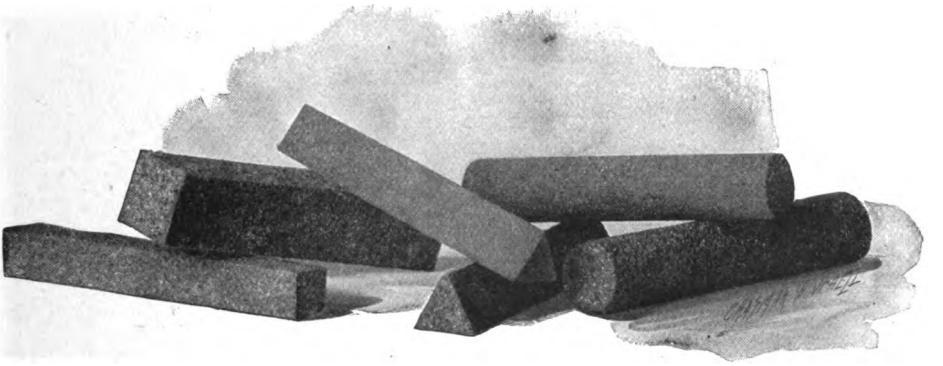
Diameter in Inches.	THICKNESS OF WHEELS IN INCHES.																Revolutions per Minute for Surface Speed of 5,000 feet.	
	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	
1	$0.25	$0.30	$0.30	$0.35	$0.35	$0.40	$0.45	$0.50	$0.55	$0.60	$0.65	$0.70	$0.75	$0.80	$0.85	$0.90	$1.00	19,099
1½	.30	.35	.40	.45	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	12,733
2	.35	.45	.50	.55	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.05	1.10	1.20	9,549
2½	.40	.55	.65	.70	.75	.86	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	2.05	7,639
3	.50	.65	.80	.90	.95	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.45	2.60	2.90	6,366
3½	.60	.80	.95	1.05	1.05	1.35	1.55	1.75	1.95	2.15	2.35	2.55	2.75	2.95	3.15	3.35	3.75	5,457
4	.75	.95	1.10	1.25	1.35	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	3.85	4.10	4.60	4,775
5	1.00	1.20	1.40	1.60	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00	5.40	5.80	6.20	7.00	3,820
6	1.40	1.60	1.75	2.10	2.40	3 05	3.70	4.35	5.00	5 65	6.30	6.95	7.60	8.25	8.90	9.55	10.85	3,183
7	1.85	2.00	2.15	2.60	3.00	3.85	4.70	5.55	6.40	7.25	8.10	8.95	9.80	10.65	11.50	12.35	14.05	2,728
8	2.10	2.35	2.60	3.10	3.60	4.60	5.60	6.60	7.60	8,60	9.60	10.60	11.60	12.60	13.60	14.60	16.60	2,387
9	2.50	2.80	3.10	3.70	4.25	5.40	6.55	7.70	8.85	10.00	11.15	12.30	13.45	14.60	15.75	16.90	19.20	2,122
10	3.00	3.35	3.65	4.35	5.00	6.35	7.70	9.05	10.40	11.75	13.10	14.45	15.80	17.15	18.50	19.85	22.55	1,910
12	3.60	3.80	4.00	5.00	6.00	7.40	9.00	10.70	12.75	14.00	15.70	17.40	19.00	20.75	22.50	24.25	27.50	1,592
14	4.05	5.15	6.25	7.35	8.45	10.65	12.85	15.05	17.25	19.45	21.65	23.85	26.05	28.25	30.45	32.65	37.05	1,364
16					10.85	13.70	16.55	19.40	22.25	25.00	27.95	30.80	33.65	36.50	39.35	42.20	47.90	1,194
18					13.25	17.00	20.75	24.50	28.25	32.00	35.75	39.50	43.25	47.00	50.75	54.50	62.00	1,061
20						20.25	24.75	29.25	33.75	38 25	42.75	47.25	51.75	56.25	60.75	65.25	74.25	955
22						25.00	31.00	37.00	43.00	49.00	55.00	61.00	67.00	73.00	79.00	85.00	97.00	868
24						29.00	36.00	43.00	50.00	57.00	64.00	71.00	78.00	85.00	92.00	99.00	113.00	796
26							43.00	51.00	59.00	67.00	75.00	83.00	91.00	99.00	107.00	115.00	131.00	735
30								61.00	72.00	83.00	94.00	105.00	116.00	127.00	138.00	149.00	171.00	637
36									110.50	126.00	141.50	157.00	172.50	188.00	203.50	219.00	250.00	531

In ordering, be careful to state diameter, thickness, size of hole, and number of Carborundum and grade, or give us sufficient information to enable us to determine these last points.

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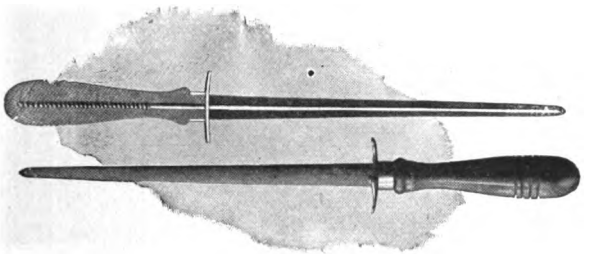
CARBORUNDUM STICKS, ETC.

CARBORUNDUM STICKS.



SQUARE STICKS.					ROUND STICKS.					TRIANGULAR STICKS.				
No.	Length, Inches.	Thickness.	Number of Carborundum.	Price per Stick.	No.	Length, Inches.	Diameter.	Number of Carborundum.	Price per Stick.	No.	Length, Inches.	Thickness.	Number of Carborundum.	Price per Stick.
1	4	1	FF	$0.40	30	4	1	FF	$0.45	60	4	1	FF	$0.50
2	4	1	180	.30	31	4	1	180	.35	61	4	1	180	.35
3	4	1	120	.30	32	4	1	120	.35	62	4	1	120	.35
4	4	¾	FF	.40	33	4	¾	FF	.45	63	4	¾	FF	.50
5	4	¾	180	.30	34	4	¾	180	.35	64	4	¾	180	.35
6	4	¾	120	.30	35	4	¾	120	.35	65	4	¾	120	.35
7	4	⅝	FF	.35	36	4	⅝	FF	.40	66	4	⅝	FF	.40
8	4	⅝	180	.25	37	4	⅝	180	.30	67	4	⅝	180	.30
9	4	⅝	120	.25	38	4	⅝	120	.30	68	4	⅝	120	.30
10	4	½	FF	.35	39	4	½	FF	.35	69	4	½	FF	.35
11	4	½	180	.25	40	4	½	180	.25	70	4	½	180	.25
12	4	½	120	.25	41	4	½	120	.25	71	4	½	120	.25
13	4	⅜	FF	.30	42	3	⅜	FF	.30	72	3	⅜	FF	.30
14	4	⅜	180	.20	43	3	⅜	180	.20	73	3	⅜	180	.20
15	4	⅜	120	.20	44	3	⅜	120	.20	74	3	⅜	120	.20
16	4	¼	FF	.30	45	2	¼	FF	.30	75	2	¼	FF	.30
17	4	¼	180	.20	46	2	¼	180	.20	76	2	¼	180	.20
18	4	¼	120	.20	47	2	¼	120	.20	77	2	¼	120	.20

CARBORUNDUM KNIFE SHARPENER.



A solid shaft of carborundum, firmly secured to handle. A steel rod gives it strength and durability.

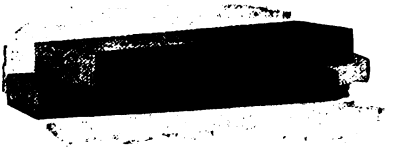
Per Dozen

Length over all, 15 inches.... $3.00

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CARBORUNDUM RAZOR HONES, COMBINATION AND SHARPENING STONES.

RAZOR HONE.



Made of extra fine hand-washed powder. Unexcelled for fast-cutting qualities. Can be used by any one without fear of producing a wire edge. Used with oil or water.

No. 101. 6 x 2 x 5/8 inches Per Hone, $1.50

COMBINATION STONES.

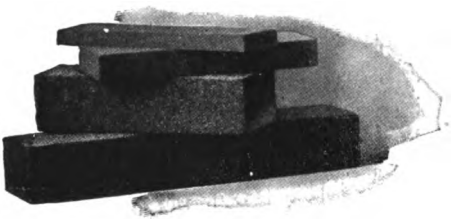


These stones are designed especially for carpenters and mechanics. They are made with one face of coarse and one face of very fine grit. The coarse side can be used for sharpening dull tools, the fine side for tools requiring a keen, sharp edge. Made in two sizes.

No. 108. 8 x 2 x 1 inches Per Stone, $1.25

No. 109. 6 x 2 x 1 inches Per Stone, 1.00

SHARPENING STONES.

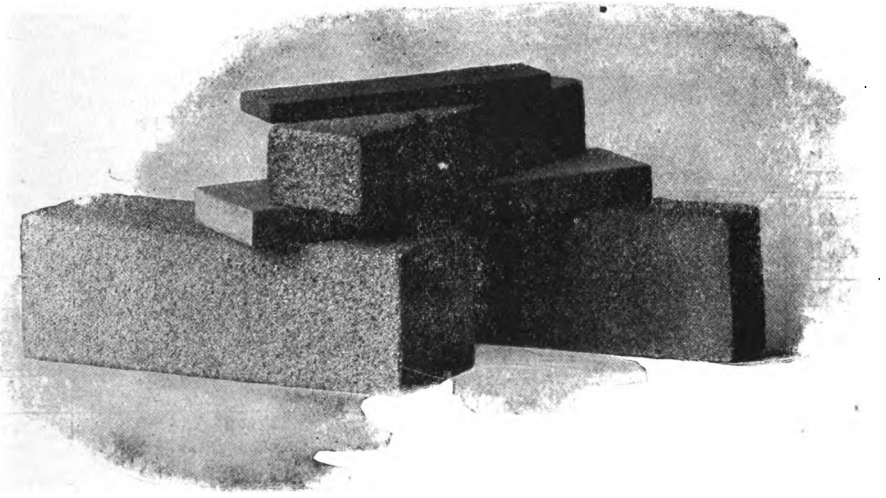


Positively unequaled for rapid-cutting qualities. Used dry or with water or oil. Are quite porous and may be tempered in their cutting by filling with wax or vaseline.

No.	Length, Inches.	Width.	Thickness.	Number of Carbor'm.	Price of Stone.	No.	Length, Inches.	Width.	Thickness.	Number of Carbor'm.	Price per Stone.	No.	Length, Inches.	Width.	Thickness.	Number of Carbor'm.	Price per Stone.
115	8	2	1	FF	$1.00	124	6	2	5/8	FF	$0.60	139	4	1½	1	FF	$0.55
116	8	2	1	180	.80	125	6	2	5/8	180	.45	140	4	1½	1	180	.40
117	8	2	1	120	.80	126	6	2	5/8	120	.45	141	4	1½	1	120	.40
118	8	2	¾	FF	.80	127	6	1½	1	FF	.65	142	4	1½	½	FF	.40
119	8	2	¾	180	.60	128	6	1½	1	180	.50	143	4	1½	½	180	.30
120	8	2	¾	120	.60	129	6	1½	1	120	.50	144	4	1½	½	120	.30
121	6	2	1	FF	.80	130	6	1½	½	FF	.45	145	4	1	¼	FF	.25
122	6	2	1	180	.60	131	6	1½	½	180	.35	146	4	1	¼	180	.20
123	6	2	1	120	.60	132	6	1½	½	120	.35	147	4	1	¼	120	.20

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CARBORUNDUM RUBBING BRICKS AND STONES.



Made for marble and granite dressing and smoothing, also for scouring castings and general foundry work. They are not squared up and dressed, but are packed as they come from the kilns. They can be used dry or with water or oil.

Following we list a few sizes most commonly used, but are prepared to furnish when called upon any size and shape, of any grit, from the very coarsest to the finest.

PRICES FOR ANY GRIT, FROM 20 TO FF.

No.	Size, Inches.	Price, Per Dozen.	No.	Size, Inches.	Price, Per Dozen.
210	8 x 4 x 4	$40.00	219	5 x 1½ x ½	$2.70
211	8 x 2 x 2	10.00	220	4 x 4 x 4	24.00
212	8 x 2 x 1	6.00	221	4 x 3 x 3	12.00
213	6 x 3 x 3	16.00	224	4 x 3 x 2	9.60
214	6 x 2 x 2	8.00	222	4 x 2 x 2	6.00
215	6 x 2 x 1	5.60	223	4 x 2 x 1	3.80
216	6 x 2 x ½	3.25	224	4 x 2 x ½	2.80
217	5 x 2½ x 1	5 60	226	4 x 1 x ½	2.10
218	5 x 1½ x 1	3.60	227	4 x 1 x ¼	1.60

UNDRESSED STICKS.

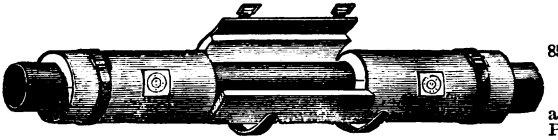
MADE IN ALL GRITS,

SQUARE STICKS.				ROUND STICKS.			
No.	Length, Inches.	Thickness.	Price, Per Dozen.	No.	Length, Inches.	Diameter.	Price, Per Dozen.
325	6	1	$3.60	350	4	1	$2.40
326	6	¾	3.50	351	4	¾	2.30
327	6	⅝	3.30	352	4	⅝	2.20
328	6	½	3.20	353	4	½	2.10
332	4	1	2.40	354	4	⅜	1.80
333	4	¾	2.30	355	4	¼	1.50
334	4	⅝	2.20		..	..	
335	4	½	2.10		..	..	
336	4	⅜	2.00		..	..	
337	4	¼	1.80		..	..	

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PHILIP CAREY MFG. CO.'S

85 PER CENT MAGNESIA SECTIONAL COVERINGS.



(Machinery patented.)

85 PER CENT. MAGNESIA PLASTIC COVERING.

Prepared Dry Carbonate of Magnesia and Asbestos Fibre, for Trowel work. Per 60-lb. bag, $5.00.

For Wrought-iron Pipe.
In Canvas-Jacketed Sections, 36 inches in length.

Inside Diameter of Pipe.	Thickness of Covering.	Weight of Covering, Per Lineal Foot.	Price per Lineal Foot Canvas-Jacketed.
½ in.	⅞ in.	8 ozs.	$0.15
¾ "	⅞ "	9 "	.16
1 "	⅞ "	10 "	.18
1¼ "	⅞ "	12 "	.20
1½ "	⅞ "	15 "	.22
2 "	1 in.	18 "	.24
2½ "	1 in.	20 "	.27
3 "	1 in.	24 "	.30
3½ "	1 in.	26 "	.34
4 "	1⅛ "	30 "	.38
4½ "	1⅛ "	38 "	.42
5 "	1⅛ "	44 "	.46
6 "	1⅛ "	48 "	.50
7 "	1¼ "	55 "	.55
8 "	1¼ "	65 "	.60
9 "	1¼ "	75 "	.65
10 "	1¼ "	85 "	.75
*12 "	1½ "	120 "	*1.00
14 "	1½ "	140 "	1.20
16 "	1½ "	170 "	1.30
18 "	1½ "	200 "	1.45
20 "	1½ "	240 "	1.60
24 "	1½ "	250 "	1.85
30 "	1½ "	280 "	2.25

*Made in sectional segments, above 10 inches. Steel tape and clips are included in the price.



PRICED LIST OF FITTINGS.

For Wrought-iron Pipe.
Canvas-jacketed Fittings readily applied.

Size.	Elbows.	Tees.	Crosses.	C. Valves
½ in.	$0.16	$0.20	$0.30	$0.30
¾ "	.20	.24	.32	.36
1 "	.20	.24	.32	.36
1¼ "	.20	.24	.32	.36
1½ "	.20	.24	.32	.36
2 "	.24	.28	.36	.40
2½ "	.28	.32	.40	.52
3 "	.32	.36	.44	.64
3½ "	.36	.40	.52	.80
4 "	.40	.48	.60	1.00
4½ "	.48	.60	.72	1.20
5 "	.60	.80	.96	1.40
6 "	.80	1.00	1.28	1.68
7 "	1.00	1.20	1.60	2.00
8 "	1.32	1.60	2.20	2.40
9 "	1.66	2.00	2.60	
10 "	2.00	2.40	3.00	

MAGNABESTOS SECTIONAL COVERINGS.

Containing 35 per cent magnesia.

For Wrought-iron Pipe.
In Canvas-Jacketed Sections, 36 inches long.

Inside Diameter of Pipe.	Weight of Covering per Lineal Foot.	Price per Lineal Foot. Canvas-Jacketed.	Inside Diameter of Pipe.	Weight of Covering per Lineal Foot.	Price per Lineal Foot. Canvas-Jacketed.
½ in.	16 ozs.	$0.15	6 in.	96 ozs.	$0.50
¾ "	18 "	.16	7 "	110 "	.55
1 "	20 "	.18	8 "	120 "	.60
1¼ "	24 "	.20	9 "	150 "	.65
1½ "	30 "	.22	10 "	170 "	.75
2 "	36 "	.24	*12 "	240 "	*1.00
2½ "	40 "	.27	14 "	280 "	1.20
3 "	48 "	.30	16 "	340 "	1.30
3½ "	52 "	.34	18 "	400 "	1.45
4 "	60 "	.38	20 "	480 "	1.60
4½ "	76 "	.42	24 "	560 "	1.85
5 "	88 "	.46	30 "	700 "	2.25

*Made in sectional segments above 10 inches. Steel tape and clips are included in the price.

Fittings for Wrought-iron Pipe.
Canvas-Jacketed Fittings readily applied.

Size.	Elbows.	Tees.	Crosses.	G. Valves
½ in.	$0.16	$0.20	$0.30	$0.30
¾ "	.20	.24	.32	.36
1 "	.20	.24	.32	.36
1¼ "	.20	.24	.32	.36
1½ "	.20	.24	.32	.36
2 "	.24	.28	.36	.40
2½ "	.28	.32	.40	.52
3 "	.32	.36	.44	.64
3½ "	.36	.40	.52	.80
4 "	.40	.48	.60	1.00
4½ "	.48	.60	.72	1.20
5 "	.60	.80	.96	1.40
6 "	.80	1.00	1.28	1.68
7 "	1.00	1.20	1.60	2.00
8 "	1.32	1.60	2.20	2.40

MAGNABESTOS PLASTIC COVERING.

Prepared non-heat-conducting Materials and Fibre, for Trowel Work. Per 80-lb. Bag, $3.00

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ASBESTOS

ASBESTOS CEMENT FELTING

This is a dry cement, prepared by mixing Asbestos fibre and other non-conductive and cementing materals so as to render them available for covering large and irregularly shaped surfaces, such as boilers, stills, domes, heaters, etc. When mixed with water to make it the proper consistency, it is easily applied by anyone either by hand or with a trowel. We make this cement in three qualities.



"A" Brand, per sack	$3 00
"B" Brand, per sack	2 50
"C" Brand, per sack	2 00

HAIR FELT.

In bales of 300 square feet, standard thickness, always in stock.

STANDARD PRICE LIST OF HAIR FELT

¼ inch thick,	$.03½ per square foot
⅜ " "	.03¾ " " "
½ " "	.04 " " "
¾ " "	.04¾ " " "
1 " "	.05½ " " "
1¼ " "	.06¾ " " "
1½ " "	.08 " " "
2 " "	.10½ " " "

ASBESTOS MILL BOARD

One of the most economical packings for chemical work, oil stills, flange joints, cylinder heads, insulation in stoves, ranges and ovens, also for lining grates, ceilings, etc. Fire-proof, and acid-proof, made soft, medium and hard. Stock size 40 x 40 inches, 42 x 44 inches and 44 x 48 inches; special sizes to order. Thicknesses from 1-32 to 1 inch.



Price per pound.....$.10

NOTE.— We are furnishing an extra hard, even and smooth surfaced board for making fire backs or back walls in grates and fire places, natural gas fires, etc. Also extra hard sheets for glass workers use, to any size. We make a Very Superior quality of Asbestos Mill Board for electrical purposes.

APPROXIMATE WEIGHT PER SHEETS 40 X 40 INCHES

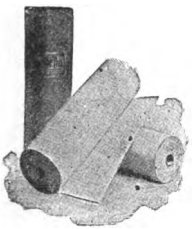
1-16 inch	3½ to 4 lbs.	3-8 inch	22 to 24 lbs.
1-8 "	7 to 7½ lbs.	1-2 "	28 to 30 lbs.
1-4 "	13½ to 14½ lbs.		

Intermediate thicknesses, proportionate weights of full cases average 250 to 300 pounds.

ASBESTOS ROLL MILL BOARD

In rolls of 1-32 to 1-8 inch inclusive in thickness 36 to 44 inches wide.

Price per lb.....$.10



ASBESTOS BUILDING FELT

Made of the best quality of Asbestos Fibre. Possesses the highest fire-proof and non-conducting qualities, odorless, acid and vermin proof and invaluable as a protection against fire. Used for lining passenger and freight cars, sheathing houses, lining between floors and under slate, tin and iron roofs, also, for wrapping furnace pipes. In rolls weighing 75 to 100 pounds, 36, 40, and 42 inches wide. Weighing from 6 to 16 pounds to 100 square feet.

Price per lb.....$.08

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CAREY'S MAGNESIA FLEXIBLE CEMENT ROOFING



The oldest and best known composition roofing on the market. Specified and used on all class of buildings; including factories, mills. foundries, warehouses, barns, stables, distilleries, storerooms, dwellings, apartments, etc., etc. For flat or steep surface. Furnished complete with all materials ready for application. Any carpenter or ordinary mechanic can apply it. Ask for sample and catalogue of the Carey Roof before placing your order elsewhere.

Price per square

CAREY'S LAP CEMENT

Per gallon.....

CAREY'S ROOF PAINT

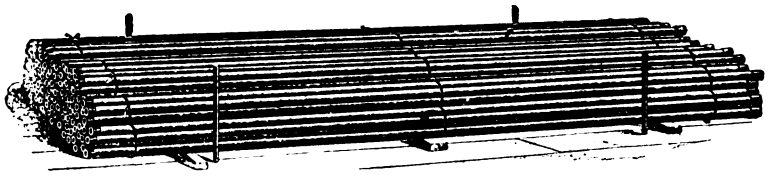
Per gallon.....

ROOFING NAILS

$\frac{7}{8}$ inch long, large head, ...per pound
$1\frac{1}{4}$ " " " " " "

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BYERS' FULL WEIGHT WROUGHT IRON PIPE



BLACK AND GALVANIZED

Size.....inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price.....per foot	.05½	.05½	.05½	.08½	.11½	.16½	.22½	.27	.36	.57½	.75½
Thickness.....inches	.068	.088	.091	.109	.113	.134	.140	.145	.154	.204	.217
Nominal Weight per ft., pounds	.24	.42	.56	.84	1.12	1.67	2.24	2.68	3.61	5.74	7.54
No. Threads per in. of Screw	27	18	18	14	14	11½	11½	11½	11½	8	8

Size.....inches	3½	4	4½	5	6	7	8	9	10	11	12
Price.....per foot	.95	1.08	1.30	1.45	1.88	2.35	2.82	3.40	4.25	4.75	5.20
Thickness.....inches	.226	.237	.246	.259	.280	.301	.322	.344	.366	.375	.375
Nominal Weight per ft., pounds	9	10.66	12.49	14.50	18.76	23.27	28.18	33.70	40.00	45.00	49.00
No. Thread; per in. of Screw	8	8	8	8	8	8	8	8	8	8	8

Unless otherwise ordered, black pipe, random lengths, with threads and couplings, will be shipped.
For cut lengths an extra charge will be made above random lengths.
For pipe smoothed on the inside, known as plugged and reamed, an extra charge will be made above regular pipe.
For galvanized pipe an extra charge will be made above black.
For asphalted pipe an extra charge will be made above black.

EXTRA STRONG WROUGHT-IRON PIPE

Size.....inches	⅛	¼	⅜	½	¾	1	1¼	1½	2
Price.....per foot	11	.11	.11	.12	.15	.22	.30	.36	.50
Actual Outside Diameter.....inches	.405	.540	.675	.840	1.05	1.315	1.66	1.9	2.375
Nominal Inside Diameter..... "	.205	.294	.421	.542	.736	.951	1.272	1.494	1.933
Thickness..... "	.1	.123	.127	.149	.157	.182	.194	.203	.221
Nominal Weight per foot.....pounds	.29	.54	.74	1.09	1.39	2.17	3.	3.63	5.02

Size.....inches	2½	3	3½	4	4½	5	6	7	8
Price.....per foot	.81	1.05	1.33	1.50	1.95	2.16	2.90	3.80	4.30
Actual Outside Diameter.....inches	2.875	3.50	4.	4.5	5.	5.563	6.625	7.625	8.625
Nominal Inside Diameter..... "	2.315	2.892	3.358	3.818	4.28	4.813	5.75	6.625	7.625
Thickness..... "	.28	304	.321	.341	360	.375	.437	.5	.5
Nominal Weight per foot.....pounds	7.67	10.25	12.47	14.97	18.22	20.54	28.58	37.67	43.

DOUBLE EXTRA STRONG WROUGHT-IRON PIPE

Size.....inches	½	¾	1	1¼	1½	2	2½	3
Price.....per foot	.25	.30	.37	.52	.65	.95	1.37	1.92
Actual Outside Diameter.....inches	.84	1.05	1.315	1.66	1.9	2.375	2.875	3.5
Nominal Inside Diameter..... "	.244	.422	.587	.885	1.088	1.491	1.755	2.284
Thickness..... "	.298	.314	.364	.388	.406	.442	.56	.608
Nominal Weight per foot.....pounds	1.7	2.44	3.65	5.2	6.4	9.02	13.68	18.56

Size.....inches	3½	4	4½	5	6	7	8
Price.....per foot	2.45	2.85	3.30	3.80	5.30	6.25	7.20
Actual Outside Diameter.....inches	4	4.5	5.	5.563	6.625	7.625	8.625
Nominal Inside Diameter..... "	2.716	3.136	3.564	4.063	4.875	5.875	6.875
Thickness..... "	.642	.682	.718	.75	.875	.875	.875
Nominal Weight per foot.....pounds	22.75	27.48	32.53	38.12	53.11	62.38	71.62

Extra Strong and Double Extra Strong will be shipped in random lengths and plain ends, unless otherwise ordered.
For pipe fitted with threads and couplings an extra charge will be made above regular.
For cut lengths an extra charge will be made above random.
For galvanized or asphalted an extra charge will be made above black.
Extra heavy or hydraulic tubes, away from standard, special prices given on application.

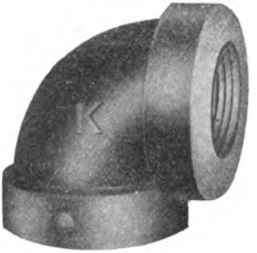
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CAST IRON FITTINGS

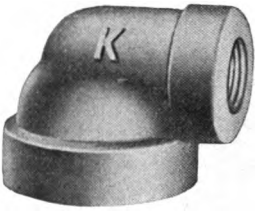
R. H. Elbow



R. & L. Elbow



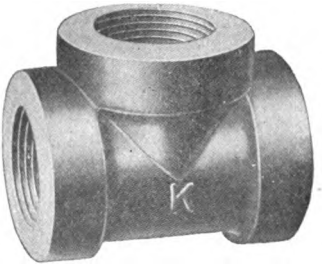
Reducing Elbow



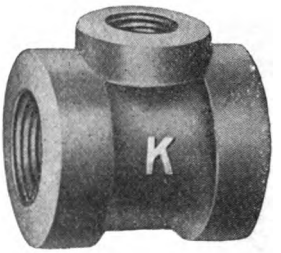
45° Elbow



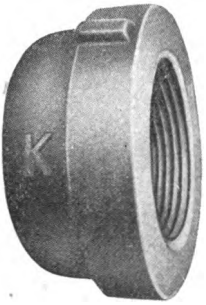
Tee



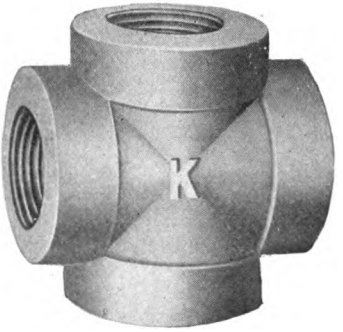
Reducing Tee



Cap



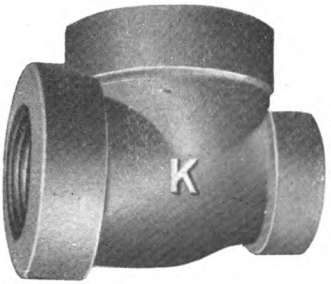
Cross



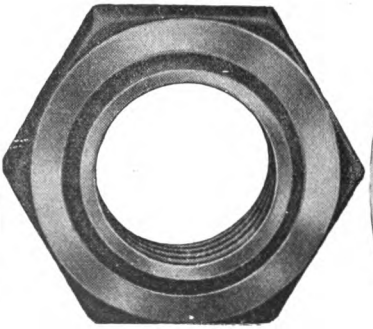
Y Bend



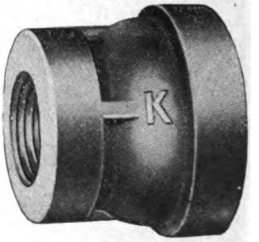
Reducing Tee



Lock-nut



Reducing Couplings



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CAST IRON FITTINGS

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Elbows, R. H., each	$0 05	$0 05	$0 06	$0 08	$0 10½	$0 16	$0 20	$0 28	$0 50	$0 75	
" R. and L., each	06	06	07	09	12	18	23	32	60	85	
" L. H., each	06	06	07	09	12	18	23	32	60	85	
" reducing, each	06	06	07	09	12	18	23	32	60	85	
" side outlet, each			18	24	30	48	60	84	1 50	2 25	
" 45°, each	06	06	07	10	12	19	24	34	60	90	
T's, each	08	08	09	12	15	23	29	41	73	1 10	
" reducing, each		09	10	14	17	27	33	47	83	1 25	
" side outlet, each			27	36	45	70	90	1 25	2 25	3 25	
Crosses, each		15	16	22	27	42	53	75	1 30	2 00	
" reducing, each			18	25	30	46	60	83	1 45	2 20	
Y Bends, each			20	28	34	54	66	94	1 66	2 50	
" reducing, each			23	33	40	62	76	1 08	1 90	2 90	
Caps, each								26	40	54	
Reducers, each								43	60	80	
Lock nuts, each								25	27	34	
Flange unions, each			40	46	52	64	78	1 00	1 25	1 50	
Plugs, each	02	02	02	03	04	05	07	10	18	25	
" solid, each	04	04	04	06	08	09	11	15	27	38	
" countersunk, each			04	06	08	09	11	15			
" left hand, each				06	08	09	11	15			
Bushings, each		04	04	05	06	07	09	14	21	30	
" faced, each		08	09	11	13	17	22	32	48	70	

Size, inches	3½	4	4½	5	6	7	8	9	10	12	
Elbows, R. H., each	$1 05	$1 20	$1 75	$2 00	$ 2 75	$ 4 70	$ 6 75	$ 9 00	$13 50	$20 00	
" R. and L., each											
" L. H., each											
" reducing, each	1 20	1 40	2 00	2 30	3 15	5 40	7 75	10 50	15 50	23 00	
" side outlet, each	3 15	3 60	5 25	6 00	8 25						
" 45°, each	1 25	1 45	2 20	2 50	3 45	5 90	8 50	11 25	17 00	25 00	
T's, each	1 50	1 75	2 55	3 00	4 00	6 80	9 75	13 00	19 50	29 00	
" reducing, each	1 75	2 00	2 95	3 50	4 60	7 80	11 25	15 00	22 50	33 50	
" side outlet, each	4 50	5 25	7 65	9 00	12 00						
Crosses, each	2 70	3 15	4 60	5 50	7 25	12 25	17 50	23 50	35 00	52 50	
" reducing, each	3 00	3 50	5 10	6 00	8 00	13 50	19 25	26 00	38 50	58 00	
Y Bends, each	3 50	4 00	5 90	7 00	9 20	15 60	22 50		45 00	67 00	
" reducing, each	4 00	4 60	6 80	8 00	10 60	18 00	26 00		51 75	77 00	
Caps, each	75	87	1 05	1 20	1 55	2 50	2 85	4 75	5 50	7 00	
Reducers, each	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00	
Lock nuts, each	47	64	85	90	1 30	1 70	2 35	2 70	3 00	4 00	
Flange unions, each	1 80	2 10	2 70	3 15	3 95	5 50	7 00	10 00	11 50	16 00	
Plugs, each	38	42	65	88	1 20	1 85	2 75	3 25	3 75	5 00	
" solid, each	57	63	1 00	1 35	1 80	2 80	4 15	5 00	5 75	7 50	
" countersunk, each											
" left hand, each											
Bushings, each	40	50	75	93	1 25	1 87	2 75	3 25	3 75	5 00	
" faced, each	1 20	1 50									

Galvanized cast iron fittings—double the list of plain fittings.

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MALLEABLE IRON FITTINGS.

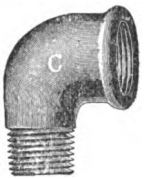
Elbow



45° Elbow



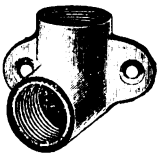
Street Elbow



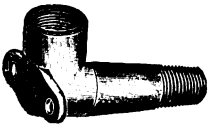
Side Outlet Elbows



Drop Elbows



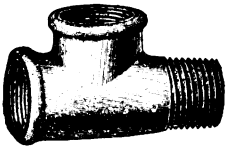
Drop Elbows, with drop 2½ inches long



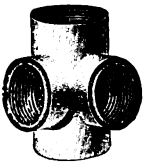
Tees



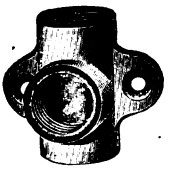
Service Tees



Four-Way Tees



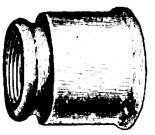
Drop Tees



Crosses



Reducers



Caps



Lock Nuts



Faced Lock Nuts



Waste Nuts



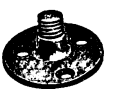
Chandelier Hooks or Loops

Extension Pieces

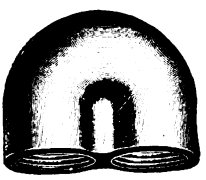




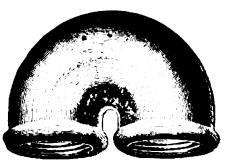
Wall Plates



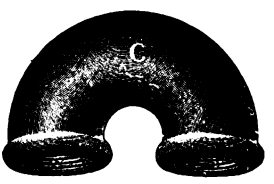
Return Bends—Close Pattern



Return Bends—Medium Pattern



Return Bends—Open Pattern



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MALLEABLE IRON FITTINGS

FOR STEAM, GAS AND WATER

PRICE LIST PER PIECE

Sizes.....inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Elbows.....each	$0 04	04	06	10	15	22	25	35	50	80	1 50	2 25	3 00
Elbows, right and left....each		05	07	12	17	25	30	40	65				
Elbows, 45°.....each		08	10	12	18	26	36	54	82	1 25	2 50	3 25	4 50
Elbows, service or street, each			10	12	20	25	40	55	90	1 50			
Elbows, s. o.....each			08	10	18	30	45	60					
Elbows, drop.....each		06	08	12	20	25							
Tees.....each	07	07	08	11	15	25	30	45	60	1 05	1 70	2 50	3 40
Tees, four-way.....each			12	14	20	35	50	80					
Tees, drop.....each		08	10	14	22	30							
Crosses.....each		08	10	12	20	30	40	60	1 00	1 75	3 00	3 25	5 25
Return bends, close.....each			...	13	25	35	50	75	1 00				
Return bends, left hand or right and left, close, each				15	30	45	60	90	1 25				
Return bends, open.....each				15	30	50	65	85	1 25	2 00	3 00		
Return bends, left hand, or right and left, open, each				20	38	60	80	1 05	1 55	2 50	3 75		
Caps.....each		03	04	05	08	12	16	24	32	45	85	1 00	1 20
Plugs.....each		03	03	05	08	10	16	19	30				
Extension pieces.....each			04	06	10	13							
Couplings, right hand.....each	03	03	04	07	10	14	20	25	35				
Couplings, reducing.....each		03	03	05	10	16	20	28	45	70	1 00	1 50	1 85
Couplings, right and left, each		04	05	08	12	16	25	36	52				
Locknuts.....each		02	03	04	05	07	09	11	18	40	50		
Waste nuts.....each		04	05	06	08	10							
Tinned straps.....each		18	18	18	18	18	18	18					
Wall brackets.....each			05										
Chandelier hooks or loops, each			10	12									

PRICE LIST PER PIECE

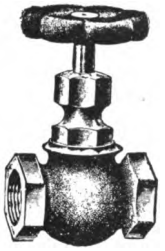
GALVANIZED

Sizes.....inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Elbows.....each	$0 05	08	14	20	32	40	60	90	1 35	2 60	3 75	5 00
Elbows, 45°.....each	12	15	20	25	40	50	85	1 35				
Elbows, service or street, each		12	15	28	35	55	80	1 30	2 50			
Elbows, drop.....each	10	12	20	35	40							
Tees.....each	09	10	16	20	38	50	70	1 00	1 90	3 00	4 25	5 75
Tees, drop.....each		15	25	40	55							
Crosses.....each		15	17	25	45	60	90	1 50	2 75	4 25	5 00	8 00
Return bends, close.....each			25	35	55	75	1 15	1 65				
Return bends, open.....each	...		25	45	70	90	1 25	2 00	3 50	5 00		
Couplings, right hand.....each	05	07	10	17	23	30	40	55				
Couplings, reducing.....each		05	08	15	25	35	45	75	1 05	1 65	2 40	3 05
Couplings, right and left, each	06	08	10	17	25	35	55	75				
Caps.....each	01	05	08	12	17	24	38	52	76	1 30		
Plugs.....each	05	05	07	11	15	25	30	45				
Locknuts.....each	03	04	05	07	10	14	20	30	55	70		
Waste nuts.....each	06	08	10	15	20							

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STANDARD BRASS AND IRON BODY VALVES, COCKS, ETC.

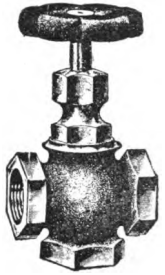
Brass Globe



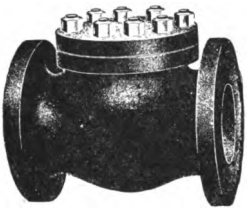
Brass Angle



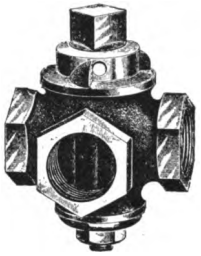
Brass Cross



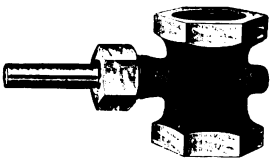
Iron Body Swing Check



Three-Way Steam Cock



Butterfly Valve

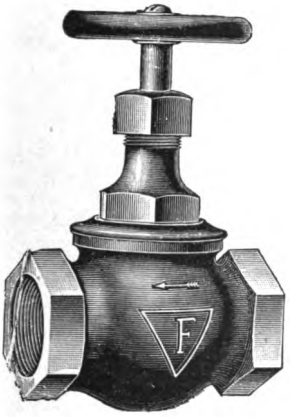


Size Inches	⅛	¼	⅜	½	¾	1	1¼	1½
Globe and Angle Valves, brass Each	$0 72	$0 72	$0 77	$1 00	$1 26	$1 80	$2 52	$3 50
Globe and Angle Valves, Jenkins Disc "		1 10	1 25	1 60	2 20	2 80	4 00	5 50
Check Valves, brass, horiz "	65	65	70	90	1 15	1 60	2 25	3 15
Check Valves, swing, brass "		1 25	1 25	2 25	2 75	3 50	4 25	5 50
Butterfly Valves, screwed, brass "					3 10	4 40	5 65	6 75
Expansion Joint, screwed, brass "				1 50	2 20	2 75	4 00	5 00
Safety Valves, brass "		2 20	2 50	3 25	3 90	4 70	7 15	9 00
Gate Valves, brass "		1 25	1 25	1 30	1 75	2 50	3 50	5 00
Steam Cocks, brass "	85	85	1 00	1 25	1 70	2 35	3 70	4 85
Gas Service Cocks, brass "	75	75	85	95	1 15	1 50	2 25	3 10
Gas Meter Cocks, brass "				1 30	1 40	1 95	3 00	4 25
Globe and Angle Valves, iron, screwed "						2 25	2 75	3 50
Globe and Angle Valves, iron, flanged "						3 25	3 85	4 80
Globe and Angle Valves, iron, yoke, screwed "								
Globe and Angle Valves, iron, yoke, flanged "								
Check Valves, iron, screwed, horiz "						1 50	2 20	2 65
Check Valves, iron, flanged, horiz "								
Safety Valves, iron, screwed "					3 50	4 00	5 00	5 80
Safety Valves, iron, flanged "						5 50	6 75	7 75
Gate Valves, iron, screwed or flanged "								
All Iron Cocks "			85	90	1 05	1 30	1 60	1 95
Iron Cocks, brass plug "			1 25	1 30	1 60	1 90	2 65	3 75

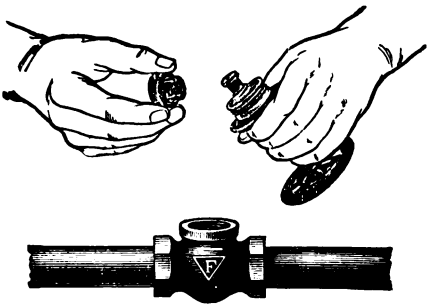
Size Inches	2	2½	3	3½	4	4½	5	6
Globe and Angle Valves, brass Each	$5 30	$10 00	$14 40	$26 50	$36 00			
Globe and Angle Valves, Jenkins Disc "	8 75	15 75	22 00					
Check Valves, brass, horiz "	4 75	9 00	13 00	24 00	32 50			
Check Valves, swing, brass "	7 50	15 00	22 00					
Butterfly Valves, screwed, brass "	10 00	13 75	21 00					
Expansion Joint, screwed, brass "	8 00	17 50	24 00					
Safety Valves, brass "	12 50	22 50	33 50					
Gate Valves, brass "	7 50	14 00	20 00					
Steam Cocks, brass "	7 30	14 50	22 50	38 50	50 00			
Gas Service Cocks, brass "	5 00	11 00	16 00					
Gas Meter Cocks, brass "	6 00							
Globe and Angle Valves, iron, screwed "	5 40	7 35	9 80					
Globe and Angle Valves, iron, flanged "	7 00	9 00	12 50					
Globe and Angle Valves, iron, yoke, screwed "	7 00	9 00	12 50	15 25	19 00	$24 00	$27 00	$37 50
Globe and Angle Valves, iron, yoke, flanged "	8 60	10 75	15 00	18 50	22 50	27 50	31 00	42 00
Check Valves, iron, screwed, horiz "	3 60	6 50	8 90	12 25	14 25	19 00	22 00	30 00
Check Valves, iron, flanged, horiz "	5 25	8 25	11 50	15 50	18 00	22 50	26 00	35 00
Safety Valves, iron, screwed "	7 80	13 25	17 25	23 00	28 75	34 50	41 50	57 75
Safety Valves, iron, flanged "	10 25	16 00	21 50	27 50	34 00	40 00	48 00	65 00
Gate Valves, iron, screwed or flanged "	10 00	12 00	15 00	18 00	20 00	23 00	25 00	30 00
All Iron Cocks "	2 70	4 40	6 75	12 00	15 50		32 00	45 00
Iron Cocks, brass plug "	5 25	8 75	13 00	27 50	36 50		67 00	94 00

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FAIRBANKS' VALVES.



IT IS SO EASY TO CHANGE THE DISCS OF



FAIRBANKS' VALVES.

BRASS GLOBE, ANGLE AND CROSS VALVES.

Renewable Vulcanized Asbestos Disc.

Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Globe and Angle Valves, Screwed	$1 10	1 10	1 25	1 60	2 20	2 80	4 00	5 50	8 75	15 75	22 00
Globe and Angle Valves, Flanged						6 00	9 00	11 00	16 50	25 00	34 00
Cross Valves, Screwed				2 25	2 50	3 25	4 75	6 25	9 50	20 00	30 00
Cross Valves, Flanged						8 75	11 50	15 25	23 00	22 00	47 00
Hose End Globe and Angle Valves				1 60	2 20	2 80	4 00	5 50	8 75	15 75	22 00
Extra Discs, each	13	14	07	09	10	12	18	25	36	48	60

IRON BODY GLOBE, ANGLE AND CROSS VALVES.

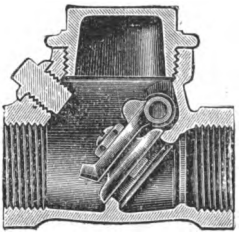
Renewable Vulcanized Asbestos Disc.

Size	2	2½	3	3½	4	4½	5	6	7	8	10	12
Globe and Angle, Brass Hub. Screwed	$ 7 25	11 00	16 00	18 50	23 00							
Globe and Angle, Brass Hub. Flanged	8 50	13 00	18 00	20 50	25 00							
Globe and Angle, with Yoke. Screwed	10 00	12 00	16 75	19 50	24 00	32 00	40 00	48 00	80 00	90 00	130 00	185 00
Globe and Angle, with Yoke. Flanged	11 75	14 00	18 50	21 50	26 00	34 00	42 00	50 00	80 00	90 00	130 00	185 00
Cross, with Yoke, Screwed	14 00	16 00	21 00	26 00	30 00	42 00	45 00	58 00				
Cross, with Yoke, Flanged	17 00	19 00	24 00	29 00	33 00	5 00	48 00	62 00				
Extra Discs, each	36	48	60	75	90	1 10	1 25	1 60	2 40	2 90	4 75	5 50

Prices, Heavy and Extra Heavy Brass and Iron Body Globe and Angle Valves upon application.

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FAIRBANKS' VALVES.



GENUINE PRATT & CADY

CHECK VALVES.

Straightway Swinging Rotating Disc; Never Sticking: Regrinding Can be used either in Horizontal or Vertical Position.

BRASS CHECK VALVES.

Straightway Swinging Rotating Brass Disc.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Screwed	$1 25	1 30	1 50	1 75	2 25	3 25	4 25	6 25	12 00	20 00
Flanged					6 25	7 85	10 25	15 50	25 00	32 50

IRON BODY CHECK VALVES.

Straightway Swinging Rotating Brass Disc.

Size	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	16
Screwed	$6 25	10 00	12 00	16 00	18 00	21 50	25 00	32 00	41 00	50 00	104 00	152 00	289 00	334 00
Flanged	6 25	10 00	12 00	16 00	18 00	21 50	25 00	32 00	41 00	50 00	104 00	152 00	289 00	334 00

GENUINE PRATT & CADY

ASBESTOS PACKED COCKS.

IRON.

Size	⅛	¼	⅜	½	¾
Screwed or Flanged	$1 30	1 30	1 45	1 60	2 10

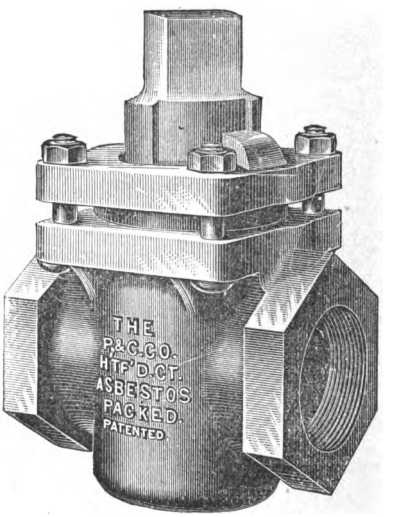
Size	1	1¼	1½	2	2½
Screwed or Flanged	2 50	3 50	4 75	7 00	12 00

Size	3	3½	4	5	6
Screwed or Flanged	18 00	27 00	30 00	45 00	60 00

Prices on Brass A. P. Cocks.
Also Heavy and Extra Heavy—and Modifications on Application.

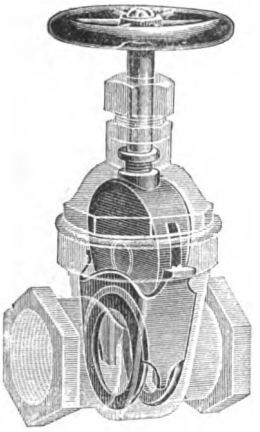
BEWARE OF IMITATIONS.

Demand the Genuine Pratt & Cady.



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FAIRBANKS' VALVES.



BRASS AND IRON BODY

GATE VALVES

"P. & C." PATENTS.

THE ONLY GATE VALVES MADE WITH

RENEWABLE SEAT RINGS.



BRASS GATE VALVES.

RENEWABLE VULCANIZED ASBESTOS SEAT RINGS.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
S. S. or R. S., Screwed	$1 50	$1 50	$1 65	$2 20	$2 80	$4 00	$ 5 30	$ 7 80	$17 00	$23 00
S. S. or R. S., Flanged			4 65	5 65	7 50	9 35	14 00	16 00	26 50	35 75
Extra Seat Rings, Each		08	08	10	14	16	20	30	70	90

IRON BODY GATE VALVES.

RENEWABLE VULCANIZED ASBESTOS SEAT RINGS.

Size	2	2½	3	3½	4	4½	5	6	7
Stationary Spindle, Screwed or Flanged	$ 7 50	$10 75	$14 00	$18 25	$20 50	$25 00	$27 00	$34 00	$41 00
Rising Spindle, Screwed or Flanged	16 50	22 75	26 00	31 75	36 50	44 00	51 00	61 00	71 00
Extra Seat Rings, Each	30	70	90	1 10	1 30	1 60	1 90	2 36	2 96

Size	8	10	12	14	16	18	20	24
Stationary Spindle, Screwed or Flanged	$51 50	$ 73 00	$100 00	$168 00	$223 00	$292 00	$346 00	$494 00
Rising Spindle, Screwed or Flanged	91 00	124 00	154 00	232 00	300 00	417 00	487 00	668 00
Extra Seat rings, Each	3 58	4 60	6 00	7 20	11 20	18 00	24 00	36 00

Prices Heavy and Extra Heavy Brass and Iron Body GATE VALVES with or without By Pass, on application. Also Gate Valves for all purposes and pressures with or without Spur or Bevel Gearing, Hydraulic Lifts, Electric Motor attachments, or other special operating devices.

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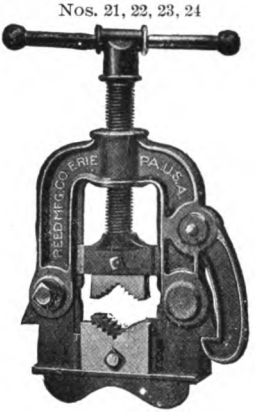
REED PIPE VISES

GUARANTEED

No. 0



Nos. 21, 22, 23, 24



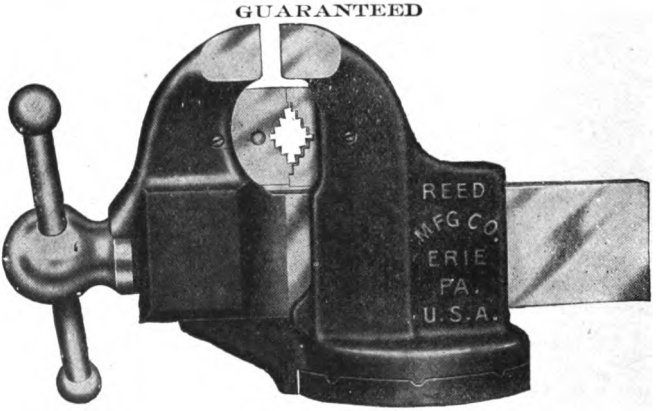
Nos. 11, 12, 13



No.	Capacity	List Vise, Each	List Jaws, Set (3)
0	⅛ to 2 in. pipe	$ 7 50	$ 3 75
11	⅛ to 2½ " "	10 00	3 75
12	⅛ to 3½ " "	14 00	5 25
13	⅛ to 4½ " "	20 00	7 50
21	⅛ to 2½ " "	10 00	3 75
22	⅛ to 3½ " "	14 00	5 25
23	⅛ to 4½ " "	20 00	7 50
24	⅛ to 6 " "	30 00	15 00

REED COMBINATION PIPE VISE

GUARANTEED



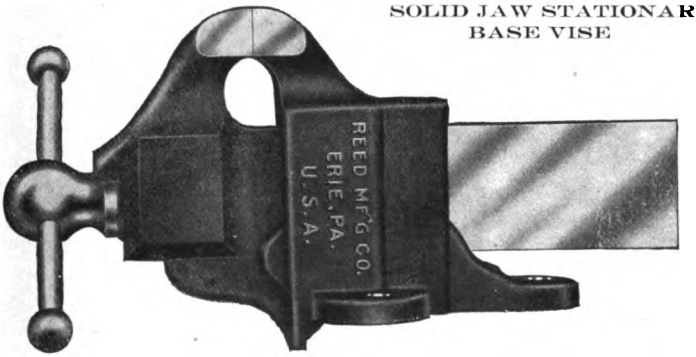
No.	Width Jaw	Weight	Capacity Pipe	Base	List Vise, Each	List Jaws, Set (3)
31	3½ in.	50 lbs.	⅛ to 2 in.	Swivel	$16 00	$1 50
32	4¼ "	72 "	⅛ to 3 "	"	20 00	1 75
33	5 "	125 "	⅛ to 4 "	"	28 00	2 00
34	6 "	185 "	⅛ to 6 "	"	35 00	3 00

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REED MACHINISTS' VISES

GUARANTEED

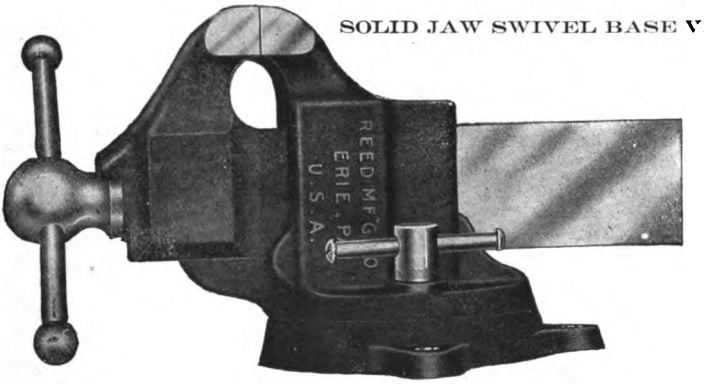
SOLID JAW STATIONARY BASE VISE



No.	Width Jaw	Opens	Weight	List Price
102½	2½ in.	3½ in.	17 lbs.	$ 4 75
103	3 in.	4 in.	21 lbs.	6 00
103½	3½ in.	5 in.	26 lbs.	7 00
104	4 in.	6 in.	40 lbs.	8 50
104½	4½ in.	6½ in.	51 lbs.	10 00
105	5 in.	7½ in.	70 lbs.	13 00
105½	5½ in.	9 in.	102 lbs.	18 50
106	6 in.	10 in.	128 lbs.	25 00
107	7 in.	12 in.	185 lbs.	37 50
999	8½ in.	12 in.	292 lbs.	50 00

The No. 104 Vise is the regular Loom Fixers Vise.
*The No. 999 Vise is the Extra Heavy Railroad Vise. The list price is subject to a different discount from the rest of the list.

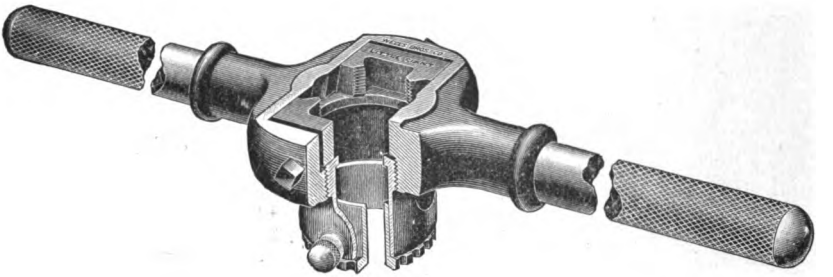
SOLID JAW SWIVEL BASE VISE



No.	Width Jaw	Opens	Weight	List Price
202½	2½ in.	3½ in.	20 lbs.	$ 5 20
203	3 in.	4 in.	28 lbs.	7 50
203½	3½ in.	5 in.	36 lbs.	8 75
204	4 in.	6 in.	50 lbs.	10 50
204½	4½ in.	6½ in.	62 lbs.	12 50
205	5 in.	7½ in.	90 lbs.	16 00
205½	5½ in.	9 in.	117 lbs.	22 00
206	6 in.	10 in.	145 lbs.	30 00
207	7 in.	12 in.	185 lbs.	42 50

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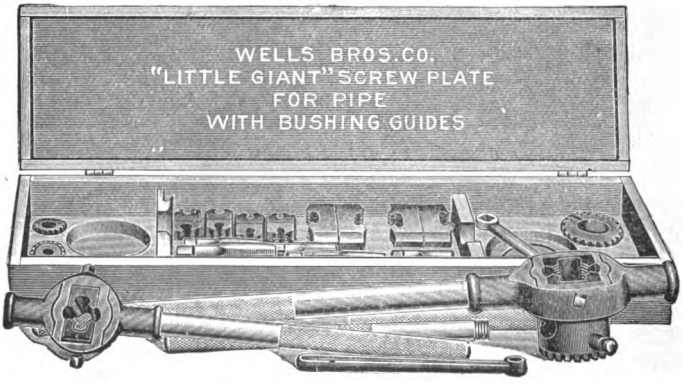
Little Giant BUSHING GUIDE PIPE PLATES



Assortment No. 0. Has Stock 26 inches long, R. H. Dies only.
Cutting ⅛, ¼, ⅜, ½ $5 00
Assortment No. 0A. Has Stock 26 inches long, R. and L. H. Dies only.
Cutting ⅛, ¼, ⅜, ½ 8 50
Assortment No. 0B. Has Stock 26 inches long, R. H. Dies and Taps.
Cutting ⅛, ¼, ⅜, ½ 7 75
Assortment No. 1. Has Stock 36 inches long, R. H. Dies only.
Cutting ¼, ⅜, ½, ¾, 1-inch 8 00
Assortment No 1½. Has Stock 41 inches long, R. H. Dies only.
Cutting ¾, 1, 1¼-inch 8 50
Assortment No. 2. Has Stock 52 inches long, R. H. Dies only.
Cutting 1¼, 1½, 2-inch 14 00
Assortment No. 3. Has Stocks 26 and 41 inches long, R. H. Dies only.
Cutting ¼, ⅜, ½, ¾, 1, 1¼-inch 14 00
Assortment No. 4. Has Stocks 36 and 52 inches long, R. H. Dies only.
Cutting ¼, ⅜, ½, ¾, 1, 1¼, 1½, 2-inch 22 00
Assortment No. 5. Has Stock 36 inches long, R. H. Dies only.
Cutting ½, ¾, 1-inch 6 50

We make assortments with R. & L. H. Dies and R. H. Dies and Taps for all the different size plates, as shown in the No. 0 Assortment.

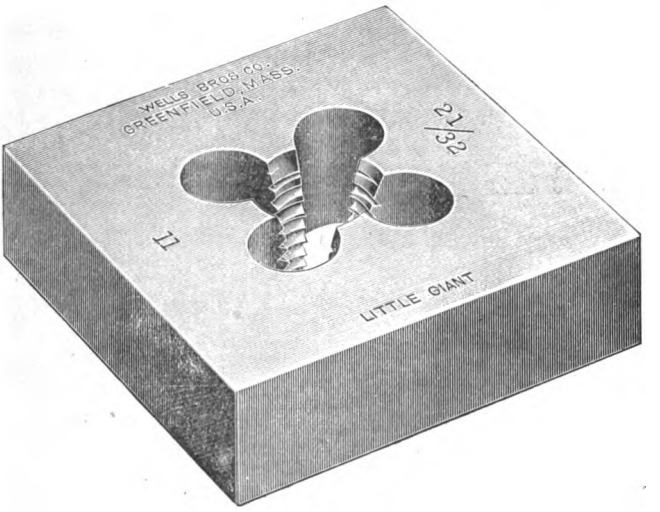
Prices quoted on application.



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Little Giant. SOLID SQUARE BOLT DIES

U. S. STANDARD, SHARP "V" OR WHITWORTH FORMS OF THREAD



FOR BOLTS

Standard	United States Standard	"V" Standard	Whitworth Standard	Size of Square	Thickness	Price each
¼	20	20	20	2½	½	$1 80
5/16	18	18	18	2½	½	1 80
3/8	16	16	16	2½	½	1 80
7/16	14	14	14	2½	½	1 80
½	13	12	12	2½	¾	1 80
9/16	12	12	12	2½	¾	1 90
5/8	11	11	11	2½	¾	2 00
11/16	11	11	11	2½	¾	2 15
¾	10	10	10	2½	¾	2 25
13/16	10	10	10	2½	¾	2 30
⅞	9	9	9	2½	¾	2 40
15/16	9	9	9	2½	¾	2 55
1	8	8	8	2½	1	2 70
1⅛	7	7	7	2½	1	3 00
1¼	7	7	7	2½	1	3 30
1⅜	6	6	6	2½	1	3 60
1½	6	6	6	3	1	3 90
1⅝	5½	5	5	3	1	4 20
1¾	5	5	5	3	1¼	5 40
1⅞	5	4½	4½	3½	1½	6 50
2	4½	4½	4½	3¾	2	7 50

All dies will be sent with "V" oversize thread, unless otherwise ordered. U. S. S. and Whitworth threads at same price.

LITTLE GIANT SOLID SQUARE DIES

FOR PIPE

Size	Dimension of Dies	Price	Price of Collets Fitted to Bolt Cutters
⅛ to ½	2 × 2 × ½	$1 50	$1 50
⅛ to 1	2½ × 2½ × ¾	2 00	1 50
½ to 1½	3 × 3 × ¾	2 50	1 50
1 to 2	4 × 4 × ⅞	3 50	2 50
2½ to 3	5 × 5 × 1¼	9 00	

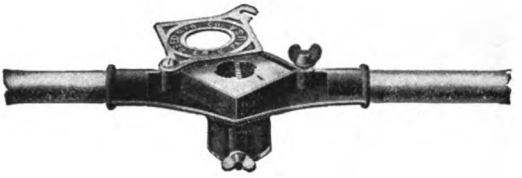
Left-hand Dies furnished at same list prices. Right-hand Dies always sent unless otherwise ordered. These dies will fit any make of stock, holding dies of above dimensions.

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REED MALLEABLE IRON PIPE STOCKS

WITH "Q & E" DIES—GUARANTEED

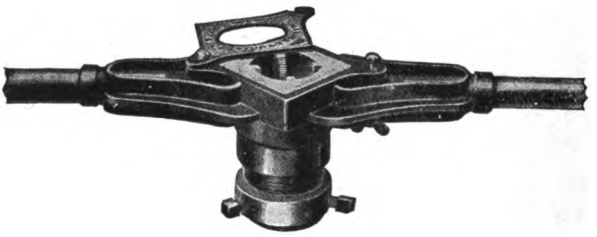
Nos. 0, 1, 1½ and 1¾



Set No.	0	1	1½	1¾	1¾ (Special)
Dimensions of Dies	2x2x½	2½x2½x¾	3x3x¾	3x3x¾	3x3x¾
Pipe Sizes of Dies	⅛,¼,⅜,½	¼,⅜,½,¾,1	¾,1,1¼	1,1¼,1½	¼,⅜,½,¾,1, 1¼
Stock Complete with R. H. Dies	$9 50	$15 00	$13 50	$13 50	$21 00
Stocks only	3 50	5 00	6 00	6 00	6 00
Extra Dies, Right or Left	1 50	2 00	2 50	2 50	2 50
Extra Bushings	25	35	45	45	45
Die Frames		30	40	40	40
Sizes of Dies furnished as Extras	¾	⅛	⅛,¼,⅜ ½,1½	⅛,¼,⅜,½,¾	⅛,1½

Right Hand Dies will be furnished unless otherwise specified.

No. 3



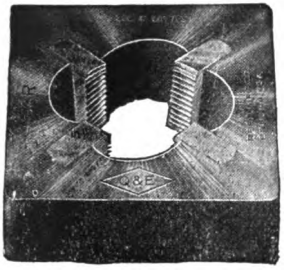
No. 2 is furnished with lead screw which can be used in threading pipe from 1 to 2 inches inclusive.

No. 3 is furnished with lead screw which can be used in threading 2½ and 3 inch only.

Set No.	2	3
Dimensions of Dies	4 x 4 x ⅞	5 x 5 x 1¼
Pipe Sizes of Dies	1¼, 1½, 2	2½ and 3
Stock Complete with R. H. Dies	$20 00	$43 00
Stocks only	9 50	25 00
Extra Dies, Right or Left	3 50	9 00
Extra Lead Screw	2 50	
Extra Bushings	60	1 00
Die Frames	50	60
Size of Dies furnished as Extras	½, ¾, 1	

Right Hand Dies will be furnished unless otherwise specified.

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Q. & E. PIPE DIES

GUARANTEED

These dies have had the test of time. They are made of a higher grade of steel than ordinarily used.

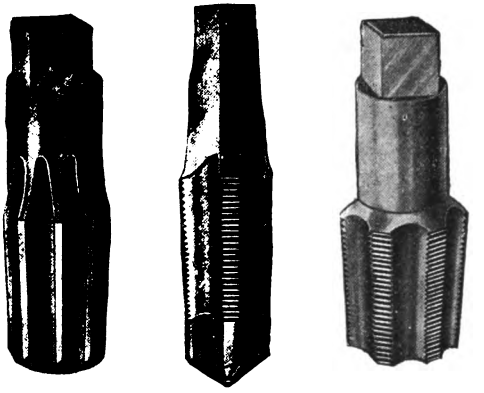
This better grade of steel and the care used in finishing give to these dies easy cutting and lasting qualities possessed by no others. If the manufacturers of the old style die used a blank of steel of the same grade as is used in the chasers of this die, the blank itself, without any labor on it at all, would cost more than the finished die sells for.

The throats are all ground after the die is hardened, on a machine made especially for this purpose, thereby giving a die with chasers absolutely true as regards a common center and insuring proper clearance and sharpness. The chasers are set at an angle in order to give ease in cutting ribbed or uneven pipe.

We absolutely guarantee these dies and will replace free any die returned as defective.

No.	Dimensions	Sizes Right or Left	List, Each
0	2 x 2 x ½	⅛, ¼, ⅜, ½, ¾ - - - - - - - - -	$1 50
1	2½ x 2½ x ¾	⅛, ¼, ⅜, ½, ¾, 1 - - - - - - -	2 00
1½	3 x 3 x ¾	⅛, ¼, ⅜, ½, ¾, 1, 1¼, 1½ - - -	2 50
2	4 x 4 x ⅞	⅛, ¼, 1, 1¼, 1½, 2 - - - - - -	3 50
3	5 x 5 x 1¼	2½, 3 - - - - - - - - - -	9 00

REED TAPS, REAMERS AND COMBINED TAP AND DRILL



The list of Reamers and Taps is the same.

Diameter Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price Taps and Reamers.....	$1 12	1 25	1 50	1 87	2 50	3 12	3 75	4 62	6 25	10 50	15 00	22 00	33 00
Price Comb. Tap and Drill.....		2 50	2 50	3 00	4 50	6 00	7 25	8 50	10 75	15 00			

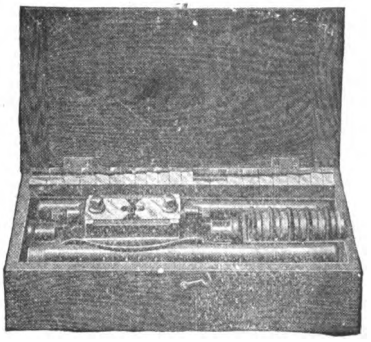
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REED'S ADJUSTABLE STOCK

ARMSTRONG PATTERN

AND DIES FOR THREADING PIPE

No. 1A Set

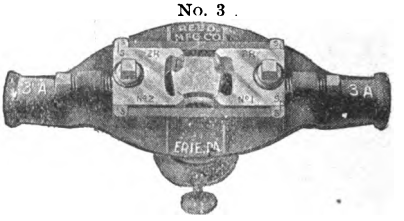


No. 1.	Stock, 4 R. H. Pipe Dies, ⅛ to ½ inch		$ 9 00
" 1.	"	4 each R. H. and L. H. Pipe Dies, ⅛ to ½ in.	14 00
" 2.	"	5 R. H. Pipe Dies, ¼ to 1 inch	12 00
" 2.	"	6 " " " ⅛ to 1 "	14 00
" 2.	"	5 each R. H. and L. H. Pipe Dies, ¼ to 1 in.	20 00
" 2.	"	6 " " " " " ⅛ to 1 "	23 00
" 2½.	"	4 R. H. Pipe Dies, ½ to 1¼ inch	12 00
" 2½.	"	4 each R. H. and L. H. Pipe Dies, ½ to 1¼ in	18 00
" 3.	"	3 R. H. Pipe Dies, 1¼ to 2 inch	20 00
" 3.	"	4 " " " 1 to 2 inch	24 00
" 3.	"	5 " " " ¾ to 2 inch	28 50
" 3.	"	3 each R. H. and L. H. Pipe Dies, 1¼ to 2 in.	32 00
" 3.	"	4 " " " " " " 1 to 2 in.	40 00
" 3.	"	5 " " " " " " ¾ to 2 in.	48 50

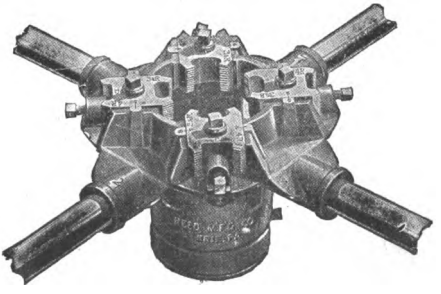
Numbers	1	2	2½	3	6	7
Stocks	$ 3 25	$ 4 00	$ 4 50	$ 7 00	$25 00	$30 00
Dies	1 25	1 50	3 25	4 00	15 00	16 00
Bushings	20	25	40	50	1 00	1 50
Wrenches	25	25	25	50	50	75
Collar Screws	12	12	15	15	25	25
Adjusting Screws	10	10	15	15	20	20
Thumb Screws	10	10	10	15		

The numbers 1, 2, and 3 sets have two handles and single end dies. The number 2½ sets have 2 handles and double ended dies ½ and ¾, 1 and 1¼ single ended, ¼" and single ended ⅜" dies can be had for this set. The numbers 6 and 7 sets have 4 handles, double ended dies and leader screws.

No. 3



No. 7



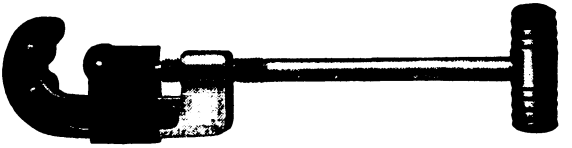
No.	Sizes	List
6	Stock Cutting 2½, 3, right	$40 00
6	" " 2½, 3, right and left	55 00
7	" " 2½ to 4, right	60 00
7	" " 2½, 3, right	45 00
7	" " 3½, 4, right	45 00
7	" " 2½ to 4, right and left	92 00
7	" " 2½, 3, left	45 00
7	" " 3½, 4, left	45 00

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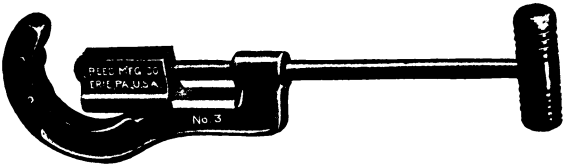
BARNES THREE-WHEEL PIPE CUTTER

REED MAKE—GUARANTEED

Shows style of Cutters Nos. 1 and 2



Shows style of Cutters Nos. 3, 4 and 5



Pipe Cutters		Cutter Wheels	Wheel Pins, per Dozen	Hooks	Slides	Nuts	Handles
No. 1, 1/8 to 1 inch....	$ 4 50	$0 25	$1 00	$ 1 75	$ 0 75	$0 25	$ 1 00
No. 2, 1/2 to 2 "	6 00	30	1 00	2 60	1 00	25	1 25
No. 3, 1 1/2 to 3 "	10 00	40	1 00	4 55	2 00		2 25
No. 4, 2 1/2 to 4 "	20 00	50	2 00	9 50	4 50	Nut and Hook one piece in these sizes.	4 50
No. 5, 4 to 6 "	30 00	75	2 00	13 75	7 00		7 00
No. 6, 6 to 8 "	40 00	75	2 00	20 00	8 50		9 25
No. 6 1/2, 8 to 10 "	45 00	75	2 00	23 00	9 50		10 25
No. 7, 9 to 12 "	50 00	75	2 00	25 00	11 25		11 50

Approximate weights of pipe cutters: No. 1, 3 lbs.; No. 2, 5 lbs.; No. 3, 8½ lbs.; No. 4, 14 lbs.; No. 5, 22½ lbs.; No. 6, 27½ lbs. No. 6½, 34 lbs.; No. 7, 51 lbs.

Discounts furnished on application.

SAUNDERS ROLLER PIPE CUTTER

REED MAKE—GUARANTEED



No.	Cuts Pipe	Cutters Each	Wheels Each	Rollers Each	Pins, Each	Blocks and Wheels Each	Handles
1	1/8 to 1	$ 3 00	$0 24	$0 24	$0 10	$1 25	$1 00
2	1 to 2	4 50	32	32	10	1 75	1 25
3	2 to 3	11 00	60	50	15	2 75	1 75
4	2 1/2 to 4	18 00	60	50	15	3 50	3 50
5	4 to 6	28 00	60	60	15	4 00	5 00

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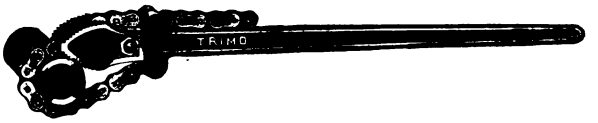
TRIMO PIPE WRENCH



PRICE LIST, SUBJECT TO DISCOUNT

Length open, in inches	6	8	10	14	18	24	36	48
Takes from	⅛ in. wire to ½ in. pipe	⅛ in. wire to ¾ in. pipe	⅛ in. wire to 1 in. pipe	¼ in. wire to 1½ in. pipe	¼ in. wire to 2 in. pipe	¼ in. wire to 2½ in. pipe	½ in. pipe to 3½ in. pipe	1 in. pipe to 5 in. pipe
Price each	$2 00	$2 00	$2 25	$3 00	$4 00	$6 00	$12 00	$18 00
Movable Jaw "	67	67	75	1 00	1 33	2 00	4 00	6 00
Nut "	20	20	27	35	42	50	65	80
Inserted Jaw "	25	25	33	50	55	65	1 00	1 25
Frame "	25	25	33	45	55	65	75	1 00

All parts interchangable and guaranteed.



TRIMO CHAIN WRENCH

STRONGEST MADE

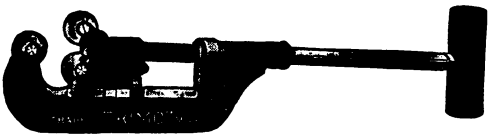
PRICE LIST, SUBJECT TO DISCOUNT

Sizes	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15	No. 16
Price with flat-link chain each	$2 50	$3 50	$5 00	$7 00	$9 00	$11 00	$18 00
Price with cable chain each	2 25	3 25	4 50	6 25	7 70	9 50	16 00
Capacity, size pipe	⅛ to 1 in.	⅛ to 2 in.	¼ to 3 in.	¾ to 6 in.	1 to 8 in.	1½ to 10 in.	2 to 12 in.
Length over all	13¾ in.	20 in.	27 in.	37 in.	45 in.	54 in.	65 in.
Weight of wrench	1⅞ lbs.	5 lbs.	9 lbs.	18 lbs.	27 lbs.	49 lbs.	83 lbs.
Extra flat-link chains each	$0. 75	$1 00	$1 50	$2 50	$3 25	$4 00	$6 00
Extra cable chains, each	50	75	1 00	1 75	2 00	2 50	4 00
Extra jaws per pair	1 00	1 75	2 75	4 00	4 75	5 50	7 50

Supplied with either flat-link or cable chain.

TRIMO PIPE CUTTER

COMBINATION 1 OR 3 WHEEL



PRICE LIST, SUBJECT TO DISCOUNT

Sizes	No. 1	No. 2	No. 3
Cuts pipe	⅛ to 1¼	½ to 2	1¼ to 3
Price each	$4 50	$6 00	$10 00
Extra Nuts "	35	35	40
Extra Wheels "	30	30	40
Extra Rolls "	30	30	40
Extra Pins with Cotter Pins per dozen	1 00	1 00	1 00

All parts interchangable and guaranteed.

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THE ELGIN
ADJUSTABLE WRENCH



Good for any work, ANYWHERE, same as any other 8-in Wrench, but goes into angles and corners where OTHER WRENCHES CANNOT (whether Pipe or Nut Wrench).

Our printed guarantee with every wrench.

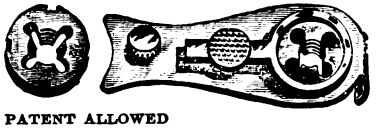
Full nickeled, 7 inches long, and high grade.



Extra Jaws will renew the Wrench indefinitely

See the RETHREADING ATTACHMENT





PATENT ALLOWED

It makes a Ratcheting Die Stock. The following dies can be had in U. S. Standard or Canada Standard bolt thread, 1-4, 5-16, 3-8, 7-16 and 1-2 inch. Also Pump Rod Dies, 3-8, 7-16 and 1-2 inch.

Inserts make a Racheting Wrench in the handle end.



¼ inch ½ inch

Square—for Taps, Set Screws and Small Nuts. Hexagon—for Cap Screws and Machine Bolts.



¼ inch ½ inch

PRICE LIST

Wrenches only, per dozen	$12 00
Attachments with one die or insert, per dozen	12 00
Extra Dies or Inserts	6 00
Extra Jaws	3 00

STILLSON'S PATENT WRENCH.

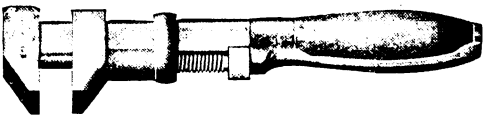


Length open in inches.	6	8	10	14	18	24	36	48
Takes from.....	⅛ to ½ in.	⅛ to ¾ in.	⅛ to 1 in.	¼ to 1½ in.	¼ to 2 in.	¼ to 2½ in.	½ to 3½ in.	1 to 5 in.
Prices.....	$2 00	$2 00	$2 25	$3 00	$4 00	$6 00	$12 00	$18 00
Jaw.....	75	75	80	1 00	1 33	2 10	4 75	7 25
Frame.....	35	35	40	50	55	80	1 30	1 50
Steel Handle.....	95	95	1 10	1 45	2 10	3 20	6 40	9 25
Nut.....	11	11	14	17	22	35	55	95
Wood Handle.....	16	16	18	25	28			

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WRENCHES

"W. & B." MACHINISTS' KNIFE HANDLE WRENCHES



Size in Inches	Price per Dozen	Size in Inches	Price per Dozen
6	$ 9 00	15	$24 00
8	10 00	18	30 00
10	12 00	21	36 00
12	14 00		

"W. & B." REGULAR WRENCHES

Size in Inches	Price per Dozen	Size in Inches	Price per Dozen
6	$10 00	12	$17 00
8	12 00	15	24 00
10	14 00		



"BULL DOG" WRENCHES

No. 3

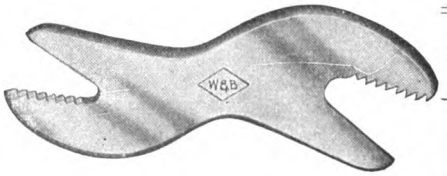


No. 1



No.	Length, Inches	Holds Pipe Diameter, Inches	Holds Round Iron Diameter, Inches	Price per Dozen
0	4	⅛ to ¼	¼ to 9-16	$ 3 00
1	5⅜	⅛ " ⅜	¼ " ¾	4 00
1½	5¾	⅛ " ½	¼ " ¾	5 00
1¾	7 1-16	⅛ " ¾	⅜ " 1⅛	8 00
2	9	⅛ " ¾	7-16 " 1	12 00
2½	12½	⅛ " 1	½ " 1¼	18 00
3	16	¼ "1¼	¾ " 1⅝	24 00
4	22	1¼ " 2	1½ " 2½	36 00
4½	24	1¼ " 2½	1⅝ " 3	45 00
5	27	2 " 3	2¼ " 3½	54 00
Twin	10	⅛ " ¾	¼ " 1	18 00

"ALWAYS READY" WRENCHES



No.	Length, Inches	Holds Square or Round Iron, Diameter, Inches	Price per Dozen, Nickeled	Price per Dozen, Black
1	5	¼ to ⅜	$ 5 00	$ 4 50
2	7	¼ " 1½	6 75	6 25
2½	9½	¼ " 1¾	10 50	10 00
3	11½	¾ " 2	16 00	15 25

WESTCOTT ADJUSTABLE "S" PIPE WRENCH



6-inch	takes pipe from	⅛ to ⅓	inch..	Each,	$1 00
8 "	" "	⅛ to ¾	"	"	1 25
10 "	" "	⅛ to 1	"	"	1 50
12 "	" "	⅛ to 1¼	"	"	2 00
14 "	" "	⅛ to 1½	"	"	2 50

WESTCOTT ADJUSTABLE "S" WRENCH

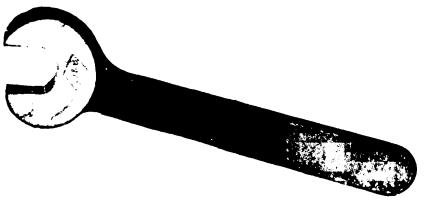


6-inch	opens to	¾	inch.....	Each,	$0 60
8 "	" "	1	"	"	75
10 "	" "	1⅜	"	"	1 00
12 "	" "	1⅝	"	"	1 25
14 "	" "	2	"	"	1 75

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WRENCHES.

ENGINEERS' WRENCHES.



These Wrenches are adapted for Machine Tools, Locomotives, Pumps, Engines and general shop use. The opening forms an angle of fifteen degrees with the handle, which admits of turning a hexagon nut completely around where the swing of the handle is limited to thirty degrees

Unfinished Wrenches, which are plain forgings and need filing or milling to fit them to nuts. Unfinished Milled Wrenches, which are milled to fit U S Standard finished nuts, but are otherwise plain Finished Wrenches, which are polished, case-hardened and milled to fit U S Standard finished nuts Any Wrenches can be milled to special sizes when required

Prices will be given for special Wrenches on receipt of samples or models When ordering, please state whether unfinished, unfinished milled or finished are desired.

Number	For U. S. Standard Nut Size Bolt	Opening Unfinished	Opening Finished	Extreme Length	Thickness Head	Price Unfinished.	Price Finished.	Number	For U. S. Standard Nut Size Bolt	Opening Unfinished	Opening Finished	Extreme Length	Thickness Head	Price Unfinished	Price Finished.
00	1/8	1/4	1/8	2 1/2	1/16	$0 08	$0 16	10	1	1 1/16	1 3/8	14 7/8	3/4	.65	1 30
0	1/8	1/4	1/8	2 7/8	3/32	09	18	11	1 1/8	1 3/16	1 1/16	16 3/8	13/16	.85	1.70
1	1/4	1/8	1/2	3 1/2	1/4	10	20	12	1 1/4	1 3/16	2	18 1/2	7/8	1 10	2 20
2	1/8	1/4	1/2	4 1/4	5/16	12	24	13	1 3/8	2 1/16	2 1/16	20 1/4	15/16	1.40	2.80
3	3/8	5/8	1/4	5 5/8	3/8	14	28	14	1 1/2	2 1/16	2 3/8	22 1/4	1 1/16	1 75	3.50
4	1/8	1/4	5/8	6 1/2	1/2	17	34	15	1 5/8	2 1/16	2 1/16	24	1 1/8	2.10	4 20
5	1/2	1/8	5/8	7 1/2	5/8	20	40	16	1 3/4	2 1/16	2 1/4	25 3/8	1 1/4	2.50	5 00
6	1/8	1/4	1/4	8 3/8	1/8	25	50	17	2	3 1/16	3 1/8	29 1/2	1 3/8	3.50	7 00
7	5/8	1	1 1/16	9 1/4	1/4	32	64	18	2 1/4	3 1/16	3 1/2	33	1 1/2	4.75	9.50
8	1/4	1/8	1 1/4	11 1/8	9/16	.40	80	19	2 1/2	3 1/16	3 7/8	37	1 5/8	6.50	13.00
9	7/8	1 3/8	1 1/16	13	5/16	50	1 00	20	3	4 1/2	4 3/8	44	1 7/8	10.50	21.00

DOUBLE HEAD.



No.	For U. S. Standard Nuts, Size Bolts.	Openings, Unfinished.	Openings, Finished.	Extreme Lgth	Thickness Heads	Price Unfinished.	Price Finished	No.	For U. S Standard Nuts Size Bolts	Openings Unfinished	Openings, Finished.	Extreme Lg th.	Thickness Heads.	Price Unfinished.	Price Finished.
21	1/8&3/16	1/4&1/4	1/8&1/4	3 1/4	1/4&1/4	$0 12	$0.24	40	1/4&1	1 1/8&1 1/16	1 1/4&1 1/16	15 1/2	9/16&3/4	.78	1.56
22	1/8&1/4	1/4&1/8	1/8&1/2	4	1/4&1/4	.14	28	41	3/8&1	1 3/8&1 1/16	1 1/4&1 5/8	15 1/2	11/16&3/4	.82	1.64
23	3/16&1/4	1/4&1/8	1/4&1/2	4	1/4&1/4	.15	.30	42	7/8&1 1/8	1 3/8&1 3/4	1 7/16&1 3/4	17 3/8	13/16&1	1.00	2.00
24	1/8&1/8	1/4&1/8	1/4&1/2	4 3/8	1/4&5/16	.17	34	43	1&1 1/8	1 3/4&1 3/4	1 5/8&1 7/8	17 3/8	1/4&1	1.08	2.16
25	1/4&3/16	1/8&1/8	1/4&1/2	4 3/8	1/4&5/16	18	.36	44	1&1 1/4	1 3/4&1 3/4	1 5/8&2	19 3/8	1/4&1	1 27	2.54
26	1/4&3/8	1/4&5/8	1/2&1/2	5 3/8	1/4&3/8	20	.40	45	1 1/8&1 1/4	1 3/4&1 3/4	1 1/2&2	19 3/8	1/4&1	1 35	2 70
27	1/8&3/8	1/4&5/8	1/2&1/2	5 3/8	5/16&5/16	.21	.42	46	1 1/8&1 3/8	1 7/8&2 1/16	1 7/8&2 3/16	21 1/4	1 1/16&1	1 65	3 30
28	5/16&7/16	1/4&3/8	1/2&3/4	6 3/4	5/16&1/4	23	.46	47	1 1/4&1 3/8	1 7/8&2 1/16	2&2 3/16	21 1/4	1 1/16&1	1.75	3.50
29	3/8&1/16	5/16&3/8	1/4&3/4	6 3/8	1/16&1/4	25	.50	48	1 1/4&1 1/2	1 7/8&2 1/16	2&2 3/8	23 1/4	1 1/16&1 1/16	2.10	4.20
30	3/8&1/2	3/8&1/2	1/4&7/8	7 1/4	5/16&3/8	.28	.56	49	1 3/8&1 1/2	2 1/16&2 1/16	2 1/16&2 3/8	23 1/4	1 1/16&1 1/16	2.26	4.50
31	1/16&1/2	3/8&1/2	3/8&3/8	7 3/4	1/2&3/8	.30	60	50	1 3/8&1 5/8	2 1/16&2 1/16	2 1/16&2 1/16	25 1/8	1 1/16&1 1/8	2.65	5.30
32	1/16&5/16	3/8&3/8	3/8&1/2	8 3/4	1/2&5/16	.34	.68	51	1 1/2&1 5/8	2 1/16&2 1/16	2 3/16&2 1/16	25 1/8	1 1/16&1 1/8	2.85	5.70
33	1/2&5/16	1/2&3/8	7/8&1/2	8 3/4	3/8&1/16	.36	.72	52	1 1/2&1 3/4	2 1/16&2 1/16	2 3/16&2 1/4	27 1/8	1 1/16&1 3/16	3.30	6.60
34	1/2&5/8	1/16&1	7/8&1 1/16	9 3/4	3/8&1/2	.41	.82	53	1 5/8&1 3/4	2 1/16&2 1/16	2 1/16&2 1/16	27 1/8	1 1/16&1 1/16	3.55	7.10
35	5/16&3/8	1/2&1	3/4&1 1/16	9 3/4	7/16&1/2	.43	86	54	1 5/8&2	2 1/16&3 1/16	2 1/16&3 1/16	30 7/8	1 1/8&1 3/8	4.15	8 30
35	1/8&1/4	3/4&1 1/16	3/4&1 1/4	11 1/8	1/16&3/16	.50	1 00	55	1 3/4&2	2 1/16&3 1/16	2 1/4&3 1/16	30 7/8	1 3/16&1 3/8	4.55	9 10
37	5/16&1/4	1&1 1/16	1 1/16&1 1/4	11 1/8	3/16&5/16	.53	1.06	56	1 1/4&2 1/4	2 1/16&3 1/16	2 1/4&3 1/2	34 5/8	1 1/16&1 1/16	5.45	10.90
38	5/16&3/8	1&1 1/16	1 1/16&1 1/16	13 1/2	3/16&5/16	.62	1.24	57	2 &2 1/4	3 1/32&3 1/32	3 1/16&3 1/2	34 5/8	1 1/16&1 1/16	6.15	12.30
39	1/4&3/8	1 1/16&1 3/8	1 1/4&1 1/16	13 1/2	1/16&5/16	.65	1 30								

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S WRENCHES WITH CONCAVE HANDLE

22½° ANGLE, DOUBLE HEAD FOR NUTS AND HEXAGON HEAD CAP-SCREWS

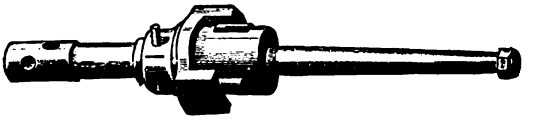


Unfinished are milled only.
Semi-finished are milled, edges ground and case-hardened all over.
Finished are milled, polished all over, case-hardened and lacquered.
In Stock with openings for U. S. Standard Finished Nuts and Hexagon Head Cap-Screws. Whitworth Standard and Metric measure to order.

Number	For U. S. Standard Nuts. Size Bolts	For Hex. Head Cap-Screws, Diam. Screws	Openings Milled	Extreme Length	Thickness Heads	Price, Unfinished	Price, Semi-finished	Price, Finished.
235E	¼ & 5/16		5/16 & 13/32	3 5/8	¼ & 9/32	$0 10	$0 15	$0 20
240B	3/8 & ¼		7/16 & ½	4 7/8	9/32 & 5/16	12	18	24
D		3/16 & ¼	3/8 & 7/16			12	18	24
E	3/16 & ¼		13/32 & ½			12	18	24
F	5/16 & 3/8		15/32 & 17/32			12	18	24
G	¼ & 5/16		½ & 19/32			12	18	24
246E		3/16 & 5/16	3/8 & ½	5¼	5/16 & 11/32	15	22	30
F		5/16 & 3/8	3/8 & 9/16			15	22	30
G		¼ & 5/16	7/16 & ½			15	22	30
H		¼ & 3/8	7/16 & 9/16			15	22	30
I	¼ & 3/8		½ & 11/16			15	22	30
251C		5/16 & 3/8	½ & 9/16	6½	3/8 & 13/32	19	28	38
D		5/16 & 7/16	½ & 5/8			19	28	38
251E	5/16 & 3/8		9/16 & 11/16	6½	3/8 & 13/32	19	28	38
F	5/16 & 7/16		11/16 & 23/32			19	28	38
255C		5/16 & ½	½ & ¾	7¼	13/32 & 7/16	24	36	48
E		3/8 & 7/16	9/16 & 5/8			24	36	48
H		3/8 & ½	9/16 & ¾			24	36	48
J	3/8 & 7/16		11/16 & 25/32			24	36	48
K	3/8 & ½		11/16 & 7/8			24	36	48
263B		7/16 & ½	5/8 & ¾	8	½ & 17/32	30	45	60
C		7/16 & 5/8	5/8 & 13/16			30	45	60
G		½ & 5/8	¾ & 13/16			30	45	60
I		½ & 5/8	¾ & 7/8			30	45	60
J	7/16 & ½		25/32 & 7/8			30	45	60
K	7/16 & 9/16		25/32 & 31/32			30	45	60
L	½ & 9/16		7/8 & 31/32			30	45	60
M	½ & 5/8		7/8 & 1 1/16			30	45	60
274B		½ & ¾	¾ & 1	10	17/32 & 9/16	38	57	76
C		9/16 & 5/8	13/16 & 7/8			38	57	76
D		9/16 & ¾	13/16 & 1			38	57	76
E		5/8 & ¾	7/8 & 1			38	57	76
G	9/16 & 5/8		31/32 & 1 1/16			38	57	76
H	9/16 & ¾		31/32 & 1 1/4			38	57	76
I	5/8 & ¾	5/8 & 7/8	1 1/16 & 1 1/4			38	57	76
281F		¾ & 7/8	7/8 & 1 1/8	11½	5/8 & 11/16	49	74	98
G		¾ & 1	1 & 1 1/8			49	74	98
H		7/8 & 1	1 & 1 1/4			49	74	98
I			1 1/8 & 1 1/4			49	74	98
J	5/8 & 7/8		1 1/8 & 1 7/16			49	74	98
K	¾ & 7/8		1 1/4 & 1 7/16			49	74	98
288F		7/8 & 1 1/8	1 1/8 & 1 3/8	14½	¾ & 7/8	65	98	1 30
G		7/8 & 1 1/4	1 1/8 & 1 1/2			65	98	1 30
H		1 & 1 1/8	1 1/4 & 1 3/8			65	98	1 30
I		1 & 1 1/4	1 1/4 & 1 1/2			65	98	1 30
J		1 1/8 & 1 1/4	1 3/8 & 1 1/2			65	98	1 30
K	¾ & 1		1 1/4 & 1 5/8			65	98	1 30
L	7/8 & 1		1 7/16 & 1 5/8			65	98	1 30
M	7/8 & 1 1/8		1 7/16 & 1 13/16			65	98	1 30

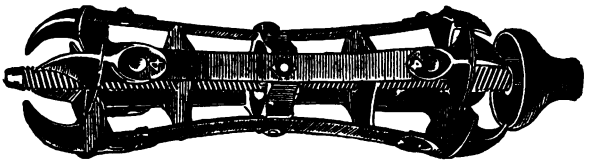
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ROLLER TUBE EXPANDER



Size of Tube, Outside.....Inches,	1	1¼	1½	1¾	2	2¼	2½	2¾
Price.....Each,	$10 00	10 00	10 00	10 00	10 00	12 00	14 00	16 00
Size of Tube, Outside.....Inches,	3	3¼	3½	4	4½	4½	5	6
Price.....Each,	$18 00	20 00	23 00	30 00	35 00	40 00	50 00	60 00

ENGINEERS' FAVORITE FLUE SCRAPER



Size.....Inches,	1½	1¾	2	2¼	2½	2¾	3
Price.....Each,	$2 00	2 00	2 00	2 25	2 50	2 75	3 00
Size.....Inches,	3¼	3½	3¾	4	4½	5	6
Price.....Each,	$3 25	3 50	3 75	4 00	5 00	6 25	7 50

PERFECTION FLUE CLEANER

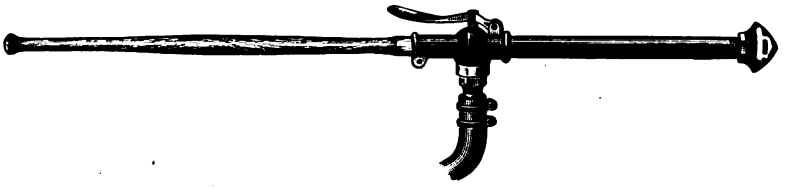


Size.....Inches,	1¼	1½	1¾	2	2¼	2½
Price.....Each,	$2 50	2 50	2 50	2 50	2 50	3 10
Size.....Inches,	3	3¼	3½	4	4½	5
Price.....Each,	$3 75	4 05	4 35	5 00	7 00	9 00

Wire handle, full length, $4.00. Flexible link, $1.00.

"MAGIC" FLUE BLOWERS

CLEANER FOR HORIZONTAL BOILERS

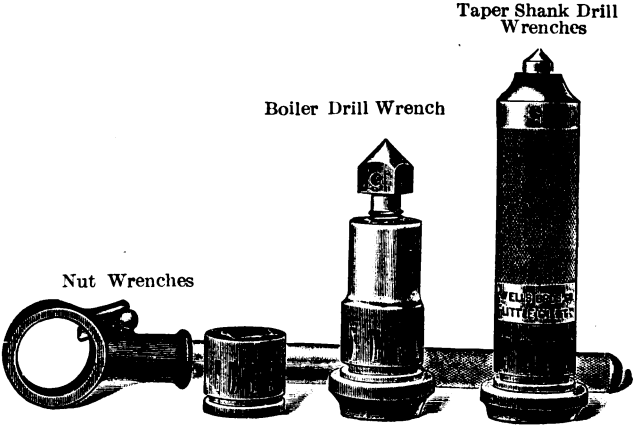


Size Tubes, Outside Diameter.....Inches,	2 to 2¼	2½ to 2¾	3 to 3¼	3½ to 3¾	4 to 4½	5 to 6
Price, with Clamps and Nipple.....Each,	$5 00	6 25	7 50	8 75	10 00	12 50

Steam hose extra—see list.

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Little Giant. RATCHET WRENCHES



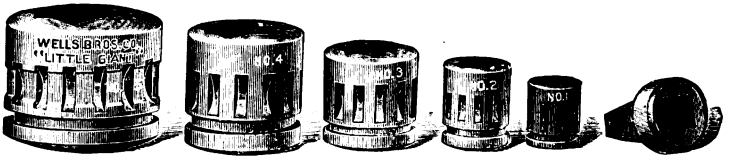
These wrenches are particularly adapted to the use of bridge builders, boiler makers, carriage makers, blacksmiths, railroad and iron construction work. Also found useful in various other trades.

There are five different size handles. Each handle holds a socket of each style, i. e., handles on wrenches Nos. 2, 22 and 32 are the same. If one handle is wanted with three different heads, take price of parts.

All wrenches are reversible. Reverse motion is instantly obtainable by simply turning pawl from one side to the other. It is not necessary to remove wrench from work.

Nos. 22 to 25 have taper shank sleeve for holding drills with taper shanks.

SOCKETS FOR RATCHET NUT WRENCHES

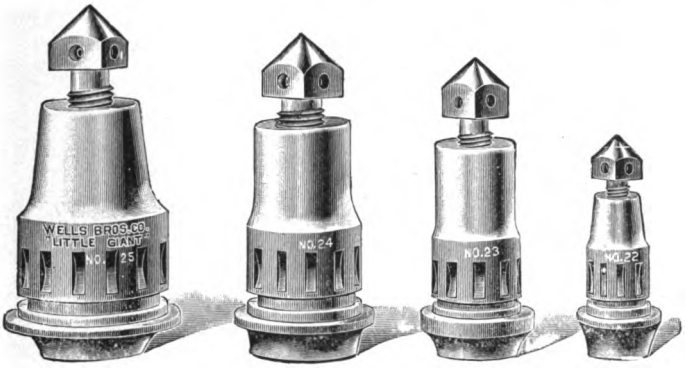


No.	Size of Squares	Length	Price Handle	Price Socket	Price Complete
1	Squares $\frac{7}{16}$ and $\frac{1}{2}$	8	$0 50	$0 50	$1 00
2	" $\frac{5}{8}$ " $\frac{11}{16}$	10	75	50	1 25
3	" $\frac{13}{16}$ " $\frac{7}{8}$	13	1 00	75	1 75
4	" $1\frac{1}{8}$ " $1\frac{1}{4}$	16	1 75	1 00	2 75
5	" $1\frac{7}{16}$ " $1\frac{5}{8}$	$20\frac{1}{2}$	2 50	1 25	3 75

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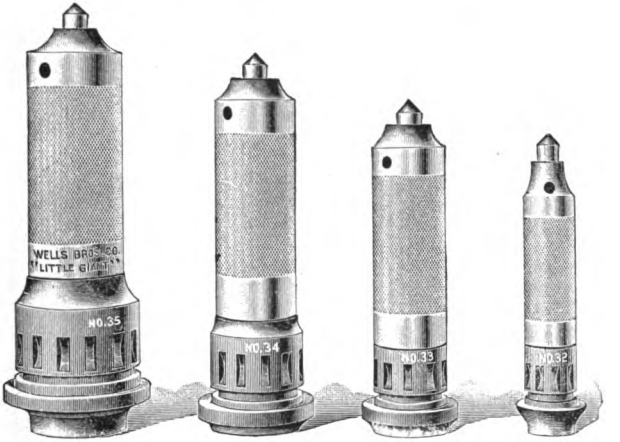
Little Giant. RATCHET WRENCHES—CONTINUED

SOCKETS FOR BOILER RATCHET DRILL WRENCHES



	Length	Price, Handle	Price, Socket	Price, Complete
22	10	$0 75	$1 50	$2 25
23	13	1 00	1 75	2 75
24	16	1 75	2 00	3 75
25	20½	2 50	2 25	4 75

SOCKETS FOR TAPER SHANK DRILL RATCHET WRENCHES



	Length	Price, Handle	Price, Socket	Price, Complete
32 Takes No. 1 Taper Shank	10	$0 75	$1 75	$2 50
33 " " 2 " "	13	1 00	2 00	3 00
34 " " 3 " "	16	1 75	2 25	4 00
35 " " " "	20½	2 50	2 50	5 00

Ratchet Taper Shank Reducers, $0 50

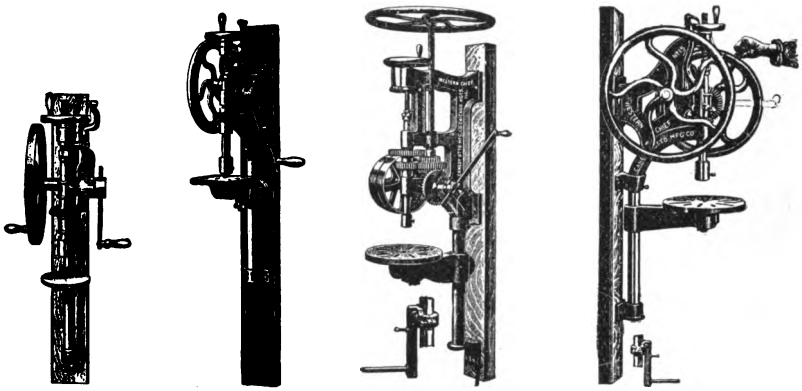
There are five different sizes of handles. With the exception of No. 1 each handle holds a socket of each style.

If one handle is wanted with other style sockets, add price of parts as given in above list.

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WESTERN CHIEF DRILLS

No. 0. No. 3. No. 12. No. 15.



NO. 0 DRILL

For light work. Self feed, changeable speed. Bores 0 to ¾-inch. Drills to center of 12 inch circle. Takes bits with ½ in. shanks. Weight, 75 pounds. Price.....$7.70

NO. 3 DRILL

A reliable drill for the price. Automatic self feed. Drills to center of 14½ in. circle. Bores 0 to 1 inch. Spindle bored for ½ or 41/64 inch shank bits. Always state size when ordering. Weight, 95 pounds. Price..$10.00

This drill may be supplied with pulleys for power.

NO. 12 DRILL

Cut gears. Automatic self feed. Fast and slow speed, instant change. Drills to center of 16 inch circle. Bores 0 to 1½ inches. Size pulleys for power, 10¾x2½ inches. Should run 175 to 180 revolutions per minute. Spindle bored for ½ or 41/64 inch shank bits. Always state size when ordering. The shaft when ordered for hand power is left extended to receive pulleys any time thereafter. Weight for hand power, 215 pounds; for pulley power, 235 pounds.

Price for Hand power only.....$27.50
Price with pulley power attachments, as illustrated..... 31.50

NO. 15 DRILL

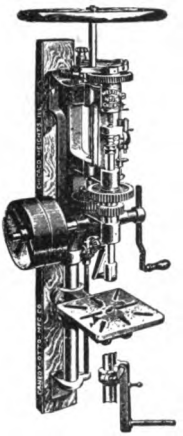
Has cut gears. Back-geared. Self feed. Changeable speed. Drills to center of 19 inch circle. Bores 0 to 1½ inches. Size pulleys, 8x2½ inches. Should run 200 revolutions per minute. Spindle bored for ½ or 41/64 inch shank bits. Always state size when ordering. Has two speeds, fast and slow, and for heavy drilling the slow speed is instantly obtained by inserting the crank handle in rim of fly wheel. Shaft on this drill when ordered for hand power is left extended to receive pulleys at any time thereafter. Wheel rims can be drilled by removing the table and using the forked support as a wheel holder. A special wheel holding attachment, as illustrated, is furnished when desired, for $2.00 extra. Weight hand power, 180 ponnds; with both hand and power, 190 pounds.

Price Hand power, as illustrated.....$17.50
Price Hand and Pulley power..... 19.50

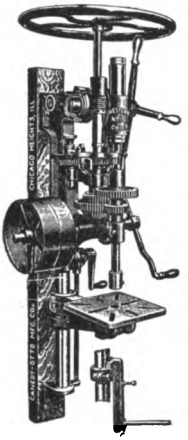
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WESTERN CHIEF DRILLS

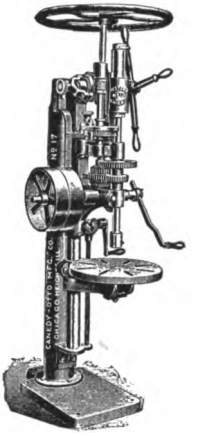
No. 14



No. 16



No. 17



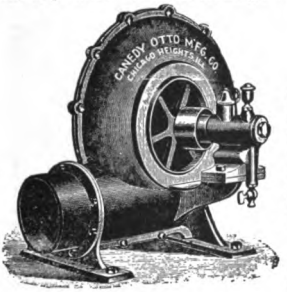
NO. 14

Fast and slow speed changed instantly. Fast and slow self-feed. It has independent quick return by means of which the operator can rapidly withdraw the bit at will, without stopping or reversing motion of machine. Or it can be set to drill any depth desired and will automatically (whether running by power or hand) reverse itself, withdraw the bit, and start drilling again and again indefinitely, all without stopping the motion of machine or turning it backward. This feature is independent of drill, and need not be used unless desired. It has mechanical device for raising and lowering the table. Pulleys are 10¾ x 2½ inches, and should run about 175 revolutions per minute. Weight, 315 pounds. Drills to center of 21-inch circle. Bores from 0 to 1½ inches. Takes bits ½ or $\frac{11}{16}$ shank.

Hand power only.....Price, $38 50
Both hand and pulley power (as illustrated)..... 42 50

NO. 16 DRILL

Cut gears, fast and slow speed, instant change. Drills to center of 24-inch circle. Bores 0 to 1½ inches. Size pulleys, 10¾ x 2½ inches. Should run 175 to 180 revolutions per minute. Spindle bored for ½ or $\frac{11}{16}$ inch shank bits. Always state size when ordering. Special wheel holding attachment $2.00 extra. Shaft left extended on drills ordered for hand power. Weight hand power, 340 pounds; hand and power, 360 pounds.



Hand power.....Price, $42 50
With pulleys (as illustrated)..... 46 50

NO. 17 DRILL

A finished floor drill for hand and pulley power. Cut gears, fast and slow speed, instant change. Hand lever feed, also horizontal, gear driven positive self feed, changed to fast, slow or medium instantly. These feeds work independently of each other and bit is lifted quickly. Drills to center of 24-inch circle. Bores 0 to 1½ inches. Height of machine, 71 inches. Floor space, 15 x 26 inches. Pulleys, 10¾ x 2½ inches. 175 revolutions per minute. Spindle bored for ½ or $\frac{11}{16}$ inch shank bits. Always state when ordering. Weight, 560 pounds.

Price as shown.....$65 00

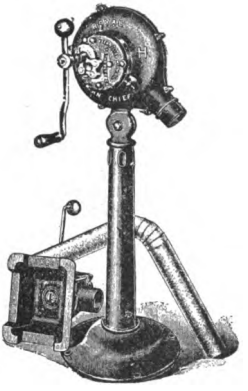
SMALL PRESSURE BLOWERS

No. of Blower	Height in Inches	Diameter of Inlet	Diameter of Outlet	Diameter of Pulley	Face of Pulley	Revolutions per min. 2-oz. Blast for Boiler Fires	Revolutions per min. 4-oz. Blast for Forge Fires	No. of Forge Fires	Sq. ft. of Boiler Grate Surface Supplied by Blower	Weight, lbs.	H.P. Required, about	Price
P 1	10	3¼	2¾	1⅞	1¼	3675	4610	1	2	15	¼	$12 00
P 2	15	4½	4¼	3	2	3000	4000	2	5	35	⅓	18 00
P 3	18	5½	4¾	3	2	2600	3600	4	6	50	1	20 00
P 4	20	6½	5¾	3½	2½	2300	3200	5	8	70	1¼	28 00
P 5	24	7	7½	4⅜	3¼	1928	2680	7	10	105	1¾	33 00

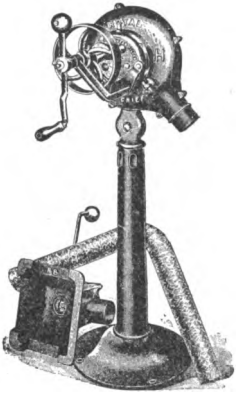
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BLOWERS

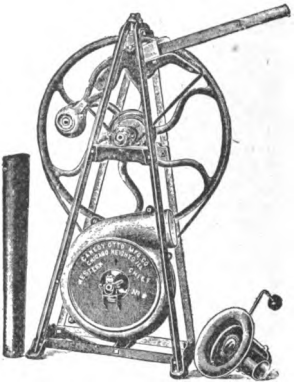
Royal Hand



Royal Hand and Power



Western Chief, Size B



ROYAL HAND BLOWER

Crank turns forward or backward. Gear case is oil-tight and dust-proof. Firepot, 8x9½x4 in. inside. Fan, 12 in. Height, 47 in. Weight, 135 lbs. Can be furnished to operate with the right arm for left-handed smiths when desired.

Price, complete.....$28.00

ROYAL HAND AND POWER BLOWER

Construction similar to the Royal Hand Blower, except has a 7½x1⅞ in. pulley so constructed that it is both a tight and loose pulley. No shifting of belts. Weight, 145 lbs.

Price, complete.....$35.00

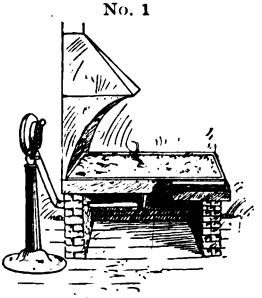
WESTERN CHIEF BLOWER, SIZE B

Lever movement only. Has brass boxes and oil cups, and noiseless friction clutch. Can be furnished to operate with right arm. Fan, 16½ in Fly wheel, 27 in. Weight, 180 lbs. Power attachment (Pulleys 7½x1¾ in.) extra $2.50, net.

Price.....$27.00

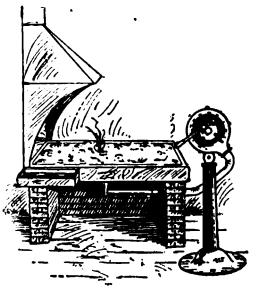
As to the position in which the Royal Blower should be placed to the forge, no absolute, unchangeable position is required. The crank turns to right or left, forward or backward, and it is largely a matter of choice with the smith. As few elbows and turns in the piping as possible is best. Illustration No. 1 shows the most popular position, and the pipe as regularly furnished is so intended.

No. 1



For left-handed smiths, with whom it is necessary to operate the blower with the right arm, a different shape of piping and reversed tuyere iron is furnished, permitting the blower to be placed as shown in Illustration No. 2. This style of piping and tuyere is only furnished when specially asked for.

No. 2



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FORGES

No. 1



WESTERN CHIEF FORGE NO. 1

Fan, 14½ inches; Hearth, 31½ x 45½ inches; Height, 30 inches; Length over all, 53 inches; Capacity to heat 4½-inch iron

This Forge is adapted to the largest, heaviest work. It has a solid Fire-pot with Tuyere Ball, furnishing side and center blast. Is equipped with Brass Boxes and Oil Cups throughout, also Noiseless Adjustable Friction Clutch. This forge can be furnished reversed, to operate with the right arm, for left-handed smiths, when desired.

Price, with One Tank, weight 315 pounds, $50.00
Price, with Extra Tank (as illustrated), weight 345 pounds..... 55.00

(Always shipped without extra tank, unless so ordered)

No. 2



WESTERN CHIEF FORGE NO. 2

Suitable for Bridge-builders, Railroads, Quarries, Well-drivers, Boilermakers, Etc.

Fan, 12 inches; Hearth, 23 x 34 inches; Height, 30 inches; Weight, 195 pounds; Capacity to heat 3-inch iron,

This Forge is equipped with Brass Boxes and Oil Cups throughout, also Noiseless, Adjustable Friction Clutch, and has a Duck Nest Fire-pot. Price.....$36.00

No. 3



WESTERN CHIEF FORGE NO. 3

Suitable for Boilermakers, Horseshoers, Small Blacksmith Shops, Etc.

Fan, 12 inches; Hearth, 23 x 34 inches; Height, 30 inches; Weight, 200 pounds; Capacity to heat 3-inch iron.

This Forge is equipped with Brass Boxes and Oil Cups throughout, also Noiseless, Adjustable Friction Clutch, and has a Duck Nest Fire-pot. Price.....$40.00

No. 4



WESTERN CHIEF FORGE NO. 4

A Splendid Forge for Mines, Quarries, Bridge-builders, Railroad, and Outdoor Repair Work.

Fan, 9 inches; Hearth, 22 inches; Height, 33 inches; Weight, 120 pounds; Capacity to heat 2½-inch iron.

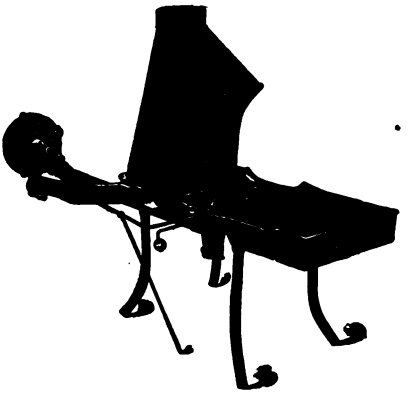
It is equipped throughout with Brass Boxes and Oil Cups, also Noiseless, Adjustable Friction Clutch. Price.....$24.00

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FORGES

ROYAL (WESTERN CHIEF) FORGE NO. 100

No. 100



For use of large blacksmith, wagon, plow, railroad shops, etc., where heavy work is done, and a first-class forge and fire are needed. Fan, 12 inches. Height, 30 inches. Hearth, 31½ x 45½ inches. Length over all, 53 inches. Crank turns forward or backward. Capacity to heat 4-inch iron.

In this forge is combined the "Royal" style of Blower with Western Chief Standard Hearth, having solid fire-pot with Tuyere Ball furnishing side and center blast. We guarantee it fully.

Price, with one tank, weight, 295 pounds.....$50 00

With extra tank (as illustrated), weight, 325 pounds..... 55 00

(Always shipped without extra tank, unless so ordered.)

ROYAL (WESTERN CHIEF) FORGE NO. 102

No. 102



For well-drillers, railroads, boilermakers, quarries, contractors, outdoor work, etc.. Fan, 10 inches. Hearth, 23 x 34 inches. Height, 30 inches. Weight, 180 pounds. Crank turns forward or backward. Capacity to heat 3½-inch iron.

The very best and highest grade throughout. The "Royal" type of Blower and Duck Nest Fire-pot.

Price.....$38 00

No. 103



ROYAL (WESTERN CHIEF) FORGE NO. 103

For horseshoers, small blacksmith shops, boilermakers, etc. Fan, 10 inches. Hearth, 23 x 34 inches. Height, 30 inches. Weight, 185 pounds. Crank turns forward or backward. Capacity to heat 3½-inch iron.

The very best and highest grade throughout. The "Royal" type of Blower and Duck Nest Fire-pot.

Price.....$42 00

No. 104



ROYAL (WESTERN CHIEF) FORGE NO. 104

Excellent for mines, quarries, bridge-builders, railroad and outdoor repair or construction work. Fan, 10 inches. Hearth, 22 inches. Height, 33 inches. Weight, 120 pounds. Crank turns forward or backward. Capacity to heat 3½-inch iron.

The very best and highest grade throughout. The "Royal" type of Blower with Cast-iron Hearth—will outwear steel hearth. The most serviceable constructed for outdoor use.

Price.....$33 00

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FORGES

No. 2C



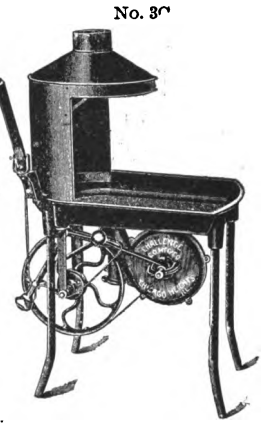
CHALLENGE FORGE NO. 2C

Suitable for Boilermakers, Bridge-builders, Railroads, Well drivers, Outdoor Work.

Fan, 12½ inches; Hearth, 35 x 23 inches; Height, 30 inches; Weight, 180 pounds; Capacity to heat 3-inch iron.

Price.....$36 00

No. 3C



CHALLENGE FORGE NO. 3C

Suitable for Machinists, Plumbers, Tin Shops, Locksmiths, Horseshoers, Small Blacksmith Shops, Etc.

Fan, 12½ inches; Hearth, 35 x 23 inches; Height 30 inches; Weight, 185 pounds; Capacity to heat 3-inch iron.

Price.....$40.00

No. 4C



CHALLENGE FORGE NO. 4C

For Quarries, Boilermakers, Mines, Bridgebuilders, Etc.

Fan, 9½ inches; Hearth, 22 inches; Height, 33 inches; Weight, 120 pounds; Capacity to heat 2½-inch iron.

Price.....$24 00

ROYAL (STEEL) FORGE NOS. 41 AND 61



For Elevated Railway, Buildings, High-up Construction and Trestle Work, Etc.

Crank Turns Forward or Backward.

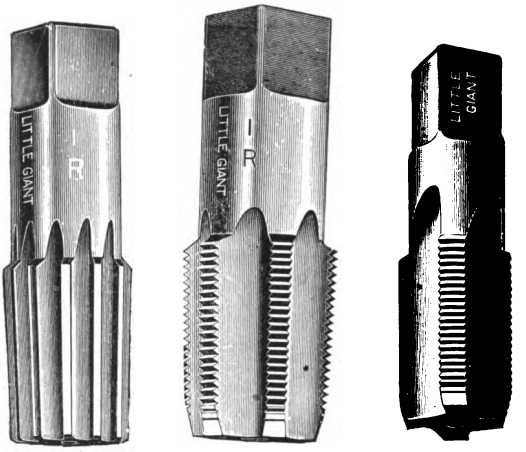
Capacity to heat 3½-inch iron.

The Ring Base on these Forges permits their use on bridges and high-up places, where it is difficult to place a Forge that has legs only. They are easily and quickly taken apart for shipping or transportation.

	Fan.	Hearth.	Height.	Weight.	Price.
No. 61	10 inch	18 inch	30 inch	95 lbs.	$38 00
No. 41	10 inch	22 inch	30 inch	100 lbs.	43 00

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Reamer Tap Straight Tap



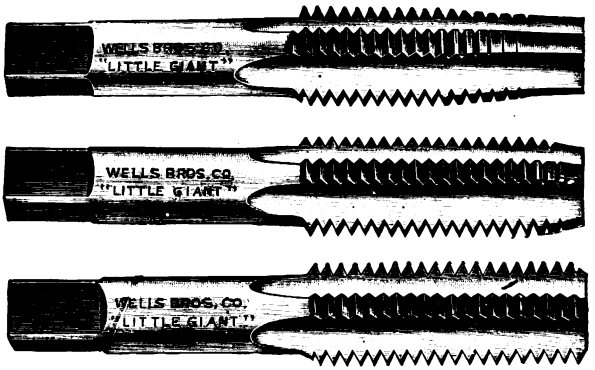
Little Giant.

PIPE REAMERS AND TAPS

Size, inch	Price
⅛	$1 12
¼	1 25
⅜	1 50
½	1 87
¾	2 50
1	3 12
1¼	3 75
1½	4 62
2	6 25

Little Giant.

MACHINISTS' HAND TAPS



Taper

Plug

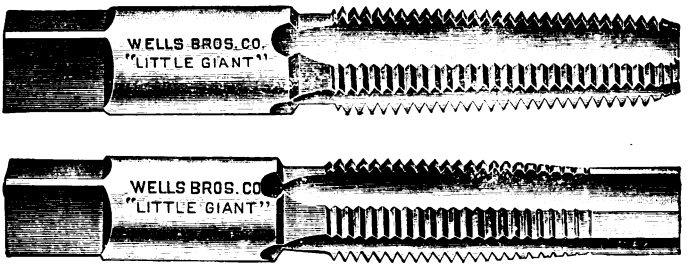
Bottoming

Diameter of Tap, Inches	No. of Threads to the Inch, U. S. Standard Form	Number of Threads to the Inch, "V" Form	Price Each	Price Per Set	Diameter of Tap, Inches	No. of Threads to the Inch, U. S. Standard Form	Number of Threads to the Inch, "V" Form	Price Each	Price Per Set
3/16	24	24 and 32	$0 35	$1 05	1⅜	6	6	$3 00	9 00
¼	20	20, 24, 27 and 32	45	1 35	1⅞	6	6	3 25	9 75
5/16	18	18, 20, 24, 27 and 32	50	1 50	1½	6	6	3 50	10 50
⅜	16	14, 16, 18, 20, 24, 27 and 32	55	1 65	1⅝	5½	5	4 20	12 60
7/16	14	12, 14, 16, 20, 24 and 27	60	1 80	1¾	5	5	5 00	15 00
½	13	12, 13, 14, 16, 20, 24 and 27	70	2 10	1⅞	5	4½	5 80	17 40
9/16	12	12, 14 and 27	80	2 40	2	4½	4½	6 70	20 10
5/8	11	10, 11, 12, 20, 24 and 27	90	2 70	2⅛	4½	4½	8 00	24 00
11/16	11	10, 11 and 12	1 05	3 15	2¼	4½	4½	9 20	27 60
¾	10	10, 12, 20 and 27	1 20	3 60	2⅜	4	4½	10 50	31 50
13/16	10	10 and 12	1 40	4 20	2½	4	4	11 50	34 50
⅞	9	9, 10, 12 and 27	1 60	4 80	2⅝	4	4	13 00	39 00
15/16	9	9 and 12	1 80	5 40	2¾	4	4	14 00	42 00
1	8	8 and 27	2 00	6 00	2⅞	4	4	15 50	46 50
1 1/16	8	8 and 12	2 15	6 45	3	3½	3½	17 00	51 00
1⅛	7	7, 8 and 12	2 25	6 75	3¼	3½	3½	20 50	61 50
1 3/16	7	7	2 45	7 35	3½	3¼	3¼	24 00	72 00
1¼	7	7 and 12	2 60	7 80	3¾	3	3	28 50	85 50
1 5/16	7	7	2 80	8 40	4	3	3	32 50	97 50

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Little Giant. TAPER AND STRAIGHT BOILER TAPS

12 "V" THREADS TO THE INCH



Diameter, Inches	Price, Each	Length Over All, Inches	No. Threads to Inch	Diameter, Inches	Price, Each	Length Over All, Inches	No. Threads to Inch
1/2	$1 00	3 3/4	12	1 5/16	$4 00	6 1/4	12
9/16	1 15	4	12	1 3/8	4 30	6 1/2	12
5/8	1 30	4 1/4	12	1 7/16	4 60	6 1/2	12
11/16	1 45	4 1/2	12	1 1/2	4 90	6 1/2	12
3/4	1 60	4 3/4	12	1 5/8	5 10	6 1/2	12
13/16	1 80	5	12	1 3/4	5 40	6 1/2	12
7/8	2 10	5 1/4	12	1 7/8	5 70	6 3/4	12
15/16	2 40	5 1/2	12	2	6 00	6 3/4	12
1	2 80	5 3/4	12	2 1/8	6 50	6 3/4	12
1 1/16	3 00	5 3/4	12	2 1/4	7 00	6 3/4	12
1 1/8	3 20	6	12	2 3/8	7 50	6 3/4	12
1 3/16	3 40	6	12	2 1/2	8 00	6 3/4	12
1 1/4	3 70	6 1/4	12	...		...	..

These Taps are slightly tapered to make a steam tight fit. Diameter given is size of tap about 5/8 inch from large end of thread.

Taps will be furnished 1/32 oversize.

All orders will be filled with V threads.

Other sizes and threads will be charged as special.

STOVE BOLT TAPS



These Taps are made to correspond in sizes and threads to the American Screw Company's stove bolts. Other sizes and threads will be charged as special. Less than six taps of a size will be charged at rate of single taps.

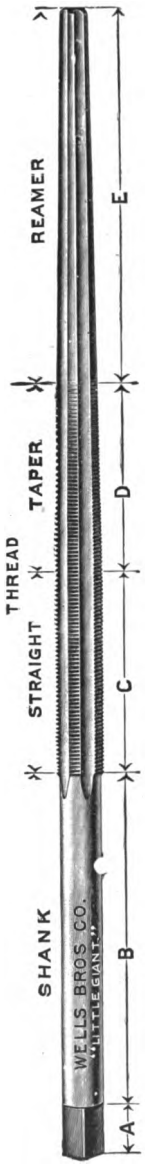
Sizes	Price, Each	Per Dozen	No. of Threads	Sizes	Price, Each	Per Dozen	No. of Threads
5/32	$0 35	$4 00	28	1/4	$0 38	$4 40	18
3/16	35	4 00	24	5/16	38	4 40	18
7/32	35	4 00	22	3/8	45	5 30	16

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Little Giant. MACHINE SCREW TAPS



Stay Bolt Tap



Less than six of a size and thread will be charged at rate of single taps.

These Taps furnished in sets of Taper, Plug and Bottoming, when desired, at regular prices.

Left hand Taps are special.

Size of Screw Gauge, No.	Standard No. of Threads	Threads Also Furnished	Price Each	Price Per Dozen
1	..	56, 60, 64, 72	$0 35	$4 00
1½	..	56	35	4 00
2	56	48, 64	35	4 00
3	48	40, 56	35	4 00
4	36	32, 40, 42, 48	35	4 00
5	36	32, 40	35	4 00
6	32	30, 36, 38, 40, 48	35	4 00
7	32	30, 40	35	4 00
8	32	30, 36, 40	35	4 00
9	30	28, 32	35	4 00
10	24	28, 30, 32, 36	35	4 00
11	24	28, 30	35	4 00
12	24	20, 32	35	4 00
13	22	20, 24, 32	38	4 40
14	20	18, 24	38	4 40
15	20	18, 24	38	4 40
16	18	16, 20	38	4 40
18	18	16, 20	38	4 40
20	16	18	45	5 30
22	16	18	45	5 30
24	16	14, 18	45	5 30
26	16	14	53	6 30
28	14	16	53	6 30
30	14	16	53	6 30

These Taps have the size of the necessary Twist Drill to be used with Tap stamped on shank of same.

STAY BOLT TAPS

Diameter, Inches	Price Each 16 in.	18 in.	21 in.	24 in.	27 in.	30 in.
¾, 13/16, ⅞	$5 60	$7 20	$8 00	$ 8 80	$10 90	$13 00
15/16, 1	6 60	8 50	9 35	10 20	12 25	14 25
1 1/16, 1⅛	7 60	9 50	10 35	11 20	13 25	15 25
1 3/16, 1¼	9 00	10 50	12 00	12 75	14 75	16 50
1 5/16, 1⅜	11 00	12 50	14 00	15 00	17 00	18 50
1 7/16, 1½	13 00	14 50	16 00	17 00	19 00	20 00

Diameter, Inches	Price Each 33 in.	36 in.	39 in.	42 in.	48 in.	54 in.
¾, 13/16, ⅞	$14 00	$15 00	$16 50	$18 00	$19 00	$20 00
15/16, 1	15 40	16 50	18 00	19 75	21 00	22 25
1 1/16, 1⅛	16 40	17 50	20 00	22 00	23 50	25 00
1 3/16, 1¼	18 00	19 50	22 00	24 00	25 50	27 00
1 5/16, 1⅜	20 00	21 50	24 00	26 00	28 00	30 00
1 7/16, 1½	22 00	23 50	26 00	28 00	30 00	32 00

READ THIS AS IT IS IMPORTANT.

All orders for these Taps should give exact diameter and number of threads per inch, also length of parts A, B, C, D, and E.

Stay Bolt Taps with 10, 11, 12 and 13 threads in either "V" or U. S. S. threads furnished at regular prices. However, 12 is the regular number and tape are always furnished with this number unless otherwise ordered.

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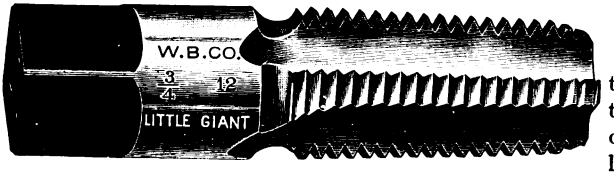
Little Giant. MACHINE NUT TAPS



All orders filled with "V" $\frac{1}{32}$ oversize threads unless otherwise ordered. "V" threads exact, U. S. and Whitworth threads furnished at same prices.

Diameter Inches	Number of Threads to Inch, V. Standard	Length Over All	Price Each	Diameter Inches	Number of Threads to Inch. V Standard	Length Over All	Price Each
$\frac{3}{16}$	24	$4\frac{1}{2}$	$0 60	$1\frac{1}{2}$	6	13	$ 4 70
$\frac{1}{4}$	20	5	60	$1\frac{5}{8}$	5	$13\frac{1}{2}$	5 30
$\frac{5}{16}$	18	$5\frac{1}{2}$	70	$1\frac{3}{4}$	5	14	6 00
$\frac{3}{8}$	16	6	80	$1\frac{7}{8}$	$4\frac{1}{2}$	$14\frac{3}{4}$	6 80
$\frac{7}{16}$	14	$6\frac{1}{2}$	90	2	$4\frac{1}{2}$	15	7 70
$\frac{1}{2}$	12	7	1 00	$2\frac{1}{8}$	$4\frac{1}{2}$	$15\frac{1}{2}$	9 00
$\frac{9}{16}$	12	$7\frac{1}{2}$	1 15	$2\frac{1}{4}$	$4\frac{1}{2}$	16	10 20
$\frac{5}{8}$	11	8	1 30	$2\frac{3}{8}$	$4\frac{1}{2}$	$16\frac{1}{2}$	11 50
$\frac{11}{16}$	11	$8\frac{1}{2}$	1 45	$2\frac{1}{2}$	4	17	12 50
$\frac{3}{4}$	10	9	1 60	$2\frac{5}{8}$	4	$17\frac{1}{2}$	14 00
$\frac{13}{16}$	10	$9\frac{1}{2}$	1 80	$2\frac{3}{4}$	4	18	15 00
$\frac{7}{8}$	9	10	2 10	$2\frac{7}{8}$	4	$18\frac{1}{2}$	16 50
$\frac{15}{16}$	9	$10\frac{1}{2}$	2 40	3	$3\frac{1}{2}$	19	18 00
1	8	11	2 80	$3\frac{1}{8}$	$3\frac{1}{2}$	$19\frac{1}{2}$	19 75
$1\frac{1}{16}$	8	11	3 00	$3\frac{1}{4}$	$3\frac{1}{2}$	$19\frac{1}{2}$	21 50
$1\frac{1}{8}$	7	$11\frac{1}{2}$	3 20	$3\frac{3}{8}$	$3\frac{1}{4}$	20	23 00
$1\frac{3}{16}$	7	$11\frac{1}{2}$	3 45	$3\frac{1}{2}$	$3\frac{1}{4}$	20	25 00
$1\frac{1}{4}$	7	12	3 70	$3\frac{5}{8}$	$3\frac{1}{4}$	$20\frac{1}{2}$	27 00
$1\frac{5}{16}$	7	12	3 95	$3\frac{3}{4}$	3	$20\frac{1}{2}$	29 50
$1\frac{3}{8}$	6	$12\frac{1}{2}$	4 20	$3\frac{7}{8}$	3	21	31 00
$1\frac{7}{16}$	6	$12\frac{1}{2}$	4 45	4	3	21	33 50

SHORT PATCH BOLT TAPS



12 "V" Threads per inch.

These Taps are slightly tapered to make a steam-tight fit. Size given is size of tap at about $\frac{3}{8}$ inch from large end of thread.

Sizes	Length Over All, Inches	Number of Threads	Price	Sizes	Length Over All, Inches	Number of Threads	Price
$\frac{1}{2}$	3	12	$0 70	$\frac{7}{8}$	3	12	$1 60
$\frac{9}{16}$	3	12	80	$\frac{15}{16}$	3	12	1 80
$\frac{5}{8}$	3	12	90	1	3	12	2 00
$\frac{11}{16}$	3	12	1 05	$1\frac{1}{8}$	3	12	2 25
$\frac{3}{4}$	3	12	1 20	$1\frac{1}{4}$	3	12	2 60
$\frac{13}{16}$	3	12	1 40				

Sharp "V" threads are sent on all orders. Rough iron sizes furnished at regular prices.

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Little Giant. PULLEY TAPS



Diameter Inches	No. of Threads to Inch: United States Standard	"V" Standard	Whitworth Standard	Price Each: 6-inch	8-Inch	10-Inch	12-Inch	14-Inch	16-Inch	18-Inch	20-Inch	22-Inch	24-Inch
¼	20	20	20	$0 65	$0 70	$0 80	$0 90						
5/16	18	18	18	75	80	1 00	1 20						
⅜	16	16	16	80	90	1 10	1 30	$1 40	$1 55	$1 70			
7/16	14	14	14	90	1 00	1 20	1 40	1 50	1 65	1 80			
½	*13	*12	12	1 00	1 15	1 30	1 45	1 60	1 75	1 90	$2 05		
9/16	12	13	12	1 10	1 30	1 45	1 55	1 70	1 85	2 05	2 20	$2 35	
⅝	11	11	11	1 20	1 35	1 50	1 60	1 75	1 90	2 10	2 25	2 40	$2 55
11/16	11	11	11	1 30	1 45	1 55	1 70	1 90	2 05	2 20	2 35	2 50	2 65
¾	10	10	10	1 40	1 50	1 60	1 80	2 00	2 15	2 30	2 45	2 60	2 75
13/16	10	10	10	1 60	1 70	1 80	2 00	2 15	2 30	2 45	2 60	2 75	2 90
⅞	9	9	9	1 80	1 90	2 10	2 30	2 50	2 70	2 90	3 10	3 30	3 50
15/16	9	9	9	2 00	2 10	2 30	2 50	2 70	2 90	3 10	3 30	3 50	3 70
1	8	8	8	2 25	2 30	2 50	2 70	2 90	3 10	3 30	3 50	3 70	3 90

*We also furnish ½-inch Pulley Taps with 12 threads to the inch, United States Standard form and 13 threads to the inch "V" Standard form, at regular list and discount.

"V" form of threads are furnished unless otherwise ordered. All sizes and threads not listed will be considered special and subject to special discounts.

BLACKSMITHS' TAPER TAPS



Size	Number of Threads per Inch: Right Hand	Left Hand	Price
⅛	30, 32		$0 30
3/16	20, 24, 26, 32	24	30
¼	16, 18, 20, 22, 24, 26	20	30
5/16	16, 18, 20, 22	18	30
⅜	12, 14, 16, 18	16	35
7/16	12, 14, 16, 18	14	40
½	12, 13, 14, 16	12, 13, 14	40
9/16	10, 12, 14	12	50
⅝	10, 11, 12, 14	10, 11, 12	50
11/16	10, 11	11	65
¾	8, 9, 10, 12	10, 12	65
⅞	8, 9, 10	9	90
1	7, 8, 9, 10	8, 9	1 25
1⅛	7, 8	7	1 50
1¼	6, 7, 8, 9	7, 8, 9	1 75
1 5/16	7		2 25
1⅜	6, 7,	6	2 50
1½	6, 7, 8	6, 7, 8	3 00
1⅝	5, 6	5	4 00
1¾	5, 6	5, 6,	4 50
2	4½	4½	6 00

All sizes and threads not listed are special and subject to special prices.

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Little Giant. HAND HORSE SHOE TAPS



FOR USE WITH A TAP WRENCH

Size	No. of Threads per Inch	Price List Each	Price List per Dozen
5/16	18	$0 50	$ 6 00
3/8	18	55	6 60
7/16	16	60	7 20
1/2	14	70	8 40
9/16	12	80	9 60
5/8	12	90	10 80

LONG OR MASTER AND SHORT HOB TAPS



LONG TAPER OR MASTER



SHORT PLUG

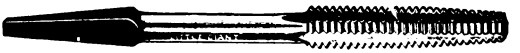
THE LONG HOB TAPS ARE FOR USE CUTTING SOLID BOLT DIES—THE SHORT FOR CUTTING OPEN DIES

Diameter	Total Length Inches Long Taper	Total Length Inches Short Plug	Number of Threads to Inch: United States Standard	"V" Standard	Whitworth Standard	"V" Threads also Furnished	Price Each Long Taper	Price Each Short Plug
1/4	3 1/2	2 3/4	20	20	20		$0 75	$0 60
5/16	4	3 1/8	18	18	18		87	70
3/8	4 1/2	3 1/2	16	16	16	14	1 00	80
7/16	5	3 3/4	14	14	14	16	1 12	90
1/2	5 1/2	4	*13	12	12	13, 14	1 25	1 00
9/16	6	4 1/4	12	12	12		1 44	1 15
5/8	6 1/2	4 1/2	11	11	11	10, 12	1 62	1 30
11/16	7	4 3/4	11	11	11	12	1 81	1 45
3/4	7 1/2	5	10	10	10		2 00	1 60
13/16	8	5 1/4	10	10	10		2 25	1 80
7/8	8 1/2	5 1/2	9	9	9		2 62	2 10
15/16	8 3/4	5 3/4	9	9	9		3 00	2 40
1	9	6	8	8	8		3 50	2 80
1 1/8	9 1/4	6 1/4	7	7	7	8	4 00	3 20
1 1/4	9 1/2	6 3/4	7	7	7		4 62	3 70
1 3/8	9 3/4	7	6	6	6		5 25	4 20
1 1/2	10	7 1/4	6	6	6		5 87	4 70
1 5/8	10 1/4	8	5 1/2	5	5		6 62	5 30
1 3/4	10 1/2	8 1/2	5	5	5		7 50	6 00
1 7/8	10 3/4	9	5	4 1/2	4 1/2		8 50	6 80
2	11	9 1/2	4 1/2	4 1/2	4 1/2		9 62	7 70

*We also furnish, at same list price and discount, ½-inch Hob Taps with 12 threads to the inch, United States Standard form.

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Little Giant. BIT BRACE TAPS



All Bit Brace Taps are sent even size, "V" Standard, unless otherwise ordered.

Diameter, Inches	No. of Threads to Inch	Price Each	Diameter, Inches	No. of Threads to Inch	Price Each
3/16	24	$0 50	3/8	14, 16	$0 60
1/4	16, 18, 20	50	7/16	12, 14	70
5/16	16, 18	55	1/2	12, 13	80

BRAZED BRASS TUBING TAPS

RIGHT OR LEFT HAND



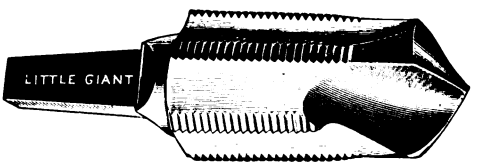
Sizes	Prices	Threads	Sizes	Prices	Threads
1/4	$0 45	27	5/8	$0 90	27
5/16	50	27	3/4	1 20	27
3/8	55	27	7/8	1 60	27
7/16	60	27	1	2 00	27
1/2	70	27			

These taps are also furnished with English Standard (which is 26 threads per inch) when so ordered.

These taps cut a straight thread. Right-hand sent unless otherwise ordered.

COMBINED PIPE TAP AND DRILL

FOR TAPPING GAS AND WATER PIPES



Sizes	Length	Price Each	Sizes	Length	Price Each
1/4	3 3/4	$1 50	1 1/4	5	$4 80
3/8	4	1 75	1 1/2	5 1/2	5 80
1/2	4 1/4	2 20	2	5 3/4	7 60
3/4	4 1/2	3 00	2 1/2	6 1/2	10 00
1	4 3/4	3 80			

Shanks for sizes 1/4 to 1 1/2 inches are 11/16 inch by 1/2 inch, and 1 3/4 inches long.
Shanks for sizes 2 and 2 1/2 inches are 1 inch by 3/4 inch, and 2 inches long.

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Little Giant. TAPPER TAPS

IN U. S. AND "V" FORM



All orders will be filled with "V" threads unless otherwise advised.
All sizes, lengths and threads not listed will be considered special and subject to special prices.

Diameter		Length of Thread	No. of Threads to Inch			Whole Length, Price Each			
Standard Size	Rough Iron Size		United States Standard	"V" Standard	Whitworth Standard	11 Inch	12 Inch	14 Inch	15 Inch
1/4		1 3/4	20	20	20	$0 70	$0 75	$0 80	$0 90
	17/64	1 3/4	20	20		70	75	80	90
	9/32	1 3/4	20	20		70	75	80	90
5/16		2	18	18	18	80	85	90	1 00
	21/64	2	18	18		80	85	90	1 00
	11/32	2	18	18		80	85	90	1 00
3/8		2	16	16	16	90	95	1 00	1 10
	25/64	2	16	16		90	95	1 00	1 10
	13/32	2	16	16		90	95	1 00	1 10
7/16		2 1/4	14	14	14	1 00	1 05	1 15	1 25
	29/64	2 1/4	14	14		1 00	1 05	1 15	1 25
	15/32	2 1/4	14	14		1 00	1 05	1 15	1 25
1/2		2 1/4	*13	*12	12	1 12	1 15	1 25	1 35
	33/64	2 1/4	*13	*12		1 12	1 15	1 25	1 35
	17/32	2 1/4	*13	*12		1 12	1 15	1 25	1 35
9/16		2 1/2	12	12	12	1 30	1 35	1 45	1 55
	37/64	2 1/2	12	12		1 30	1 35	1 45	1 55
	19/32	2 1/2	12	12		1 30	1 35	1 45	1 55
5/8		2 1/2	11	11	11	1 45	1 50	1 65	1 75
	41/64	2 1/2	11	11		1 45	1 50	1 65	1 75
	21/32	2 1/2	11	11		1 45	1 50	1 65	1 75
11/16		2 1/2	11	11	11	1 62	1 70	1 80	1 95
	23/32	2 1/2	11	11		1 62	1 70	1 80	1 95
3/4		2 3/4	10	10	10	1 80	1 85	2 00	2 10
	25/32	2 3/4	10	10		1 80	1 85	2 00	2 10
13/16		2 3/4	10	10	10	2 05	2 10	2 25	2 35
	27/32	2 3/4	10	10		2 05	2 10	2 25	2 35
7/8		3	9	9	9	2 35	2 45	2 60	2 75
	29/32	3	9	9		2 35	2 45	2 60	2 75
15/16		3	9	9	9	2 70	2 75	3 00	3 15
	31/32	3	9	9		2 70	2 75	3 00	3 15
1		3 1/2	8	8	8	3 15	3 20	3 50	3 65
	1 1/32	3 1/2	8	8		3 15	3 20	3 50	3 65
1 1/8		3 1/2	7	7	7	3 60	3 70	3 95	4 10
	1 5/32	3 1/2	7	7		3 60	3 70	3 95	4 10
1 1/4		3 1/2	7	7	7	4 15	4 25	4 50	4 65
	1 9/32	3 1/2	7	7		4 15	4 25	4 50	4 65
1 3/8		4	6	6	6	4 70	4 80	5.05	5 20
	1 13/32	4	6	6		4 70	4 80	5 05	5 20
1 1/2		4	6	6	6	5 30	5 40	5 65	5 80

* We also furnish in both Even and Rough Iron Sizes, ½-inch Tapper Taps with 12 threads to the inch, United States Standard form, and 13 threads to the inch, "V" Standard form, at regular list and discount.

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Little Giant. TAP WRENCHES



PRICE LIST OF ADJUSTABLE WRENCHES FOR MACHINISTS HAND TAPS

No. 00	Length,	5	inches, for taps	$\frac{3}{16}$	inches and smaller				$1 25
No. 0	"	7	"	"	$\frac{1}{16}$	"	to $\frac{1}{4}$	inch	1 50
No. 5	"	$10\frac{1}{2}$	"	"	$\frac{3}{16}$	"	to $\frac{1}{2}$	"	2 00
No. 6	"	15	"	"	$\frac{1}{4}$	"	to $\frac{3}{4}$	"	2 50
No. 7	"	20	"	"	$\frac{3}{8}$	"	to 1	"	3 50
No. $7\frac{1}{2}$	"	30	"	"	$\frac{3}{8}$	"	to $1\frac{1}{4}$	"	6 50
No. 8	"	42	"	"	$\frac{3}{4}$	"	to $1\frac{1}{2}$	"	8 00

The above shows the prices of Wrenches furnished in "Little Giant" Screw Plates.

Little Giant. SPLIT DIE SCREW PLATES

ROUND ADJUSTABLE DIES, $1\frac{3}{16}$ INCH DIAMETER



Furnished in Plush-Lined Top Cases. Each assortment has adjustable tap wrench. Dies $1\frac{3}{16}$ diameter are furnished in number sizes to 16; fractional sizes $\frac{9}{32}$. Length of Stock, 6 inches. Length of Tap Wrench, 7 inches.

No. DD6 Cutting, $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{32}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, $\frac{9}{32}^{20}$ $5 75

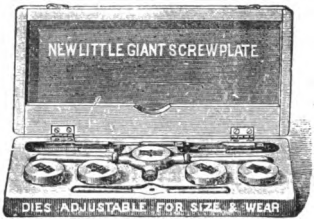
6 Taps, 6 Dies, Guides, Stock and Adjustable Tap Wrench.

No. DD8 Cutting $\frac{1}{16}^{60}$, $\frac{3}{32}^{48}$, $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{32}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, $\frac{9}{32}^{20}$ $7 25

8 Taps, 8 Dies, Guides, Stock and Adjustable Tap Wrench.

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Little Giant SCREW PLATES



ASSORTMENT NO. A1

Stock 7½″ long. Adjustable Tap Wrench No. 0.
Plug Taps, Dies, Collets 1¼″ diameter.

Cutting $\frac{1}{8}^{40}$, $\frac{5}{32}^{32}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$.....$ 6 50



ASSORTMENT NO. 5

Stock 23″ long. Adjustable Tap Wrench No. 6.
Taper Taps, Dies, Collets 2¾″ diam.

Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$..... 16 00



ASSORTMENT NO. 7

Stock 26″ long. Two Adjustable Tap Wrenches Nos. 5 and 7.
Taper Taps, Dies, Collets 2¾″ Diam.

Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}..... 25 50

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Little Giant SCREW PLATES



ASSORTMENT No. 40

Two Stocks 23" and 40" long. Two Adjustable Tap Wrenches, Nos. 6 and 7½.
Taper Taps, Dies.
Collets 2¾" diameter for first seven sizes, 4" diameter for larger.

Cutting ¼[20], $\frac{5}{16}$[18], $\frac{3}{8}$[16], $\frac{7}{16}$[14], ½[12], $\frac{5}{8}$[11], ¾[10], $\frac{7}{8}$[9], 1[8]. 1⅛[7], 1¼[7] $40 00

"V" threads oversize furnished unless otherwise ordered.
"V" threads, exact sizes, U. S. S. and Whitworth threads furnished at same list prices.

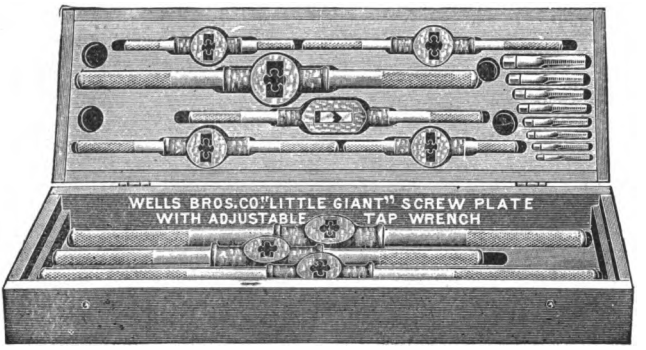
LIST OF ASSORTMENTS

Each Assortment is put up in a neat Wood Case, as shown in Cuts.

		Price
No. A1	Cuts ⅛, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, ¼	$ 6 50
No. A2	Cuts $\frac{7}{64}$, ⅛, $\frac{9}{64}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, ¼	8 00
No. A3	Cuts $\frac{7}{64}$, ⅛, $\frac{9}{64}$, $\frac{5}{32}$, $\frac{11}{64}$, $\frac{3}{16}$, $\frac{13}{64}$, $\frac{7}{32}$, $\frac{15}{64}$, ¼	10 50
No. A10	Cuts ⅛, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, ¼, $\frac{5}{16}$, ⅜	11 50
No. A12	Cuts 4, 6, 8, 10, 12, 14, 16, 18	12 75
No. A14	Cuts ¼, $\frac{5}{16}$, ⅜	6 25
No. 1	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½	12 00
No. 2	Cuts ¼, ⅜, ½, $\frac{5}{8}$, ¾	13 50
No. 3	Cuts $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1	15 00
No. 4	Cuts ½, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1	17 50
No. 5	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾	16 00
No. 5½	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{9}{16}$, $\frac{5}{8}$, ¾	18 50
No. 6	Cuts ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1	22 00
No. 7	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1	25 50
No. 7½	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{9}{16}$, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1	28 00
No. 8	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾	18 00
No. 9	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1	27 50
No. 20	Cuts $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1, 1⅛, 1¼	35 00
No. 25	Cuts $\frac{7}{8}$, 1, 1⅛, 1¼, 1⅜, 1½	45 00
No. 30	Cuts 1⅛, 1¼, 1⅜, 1½	37 50
No. 40	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1, 1⅛, 1¼	40 00
No. 50	Cuts ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, $\frac{5}{8}$, ¾, $\frac{7}{8}$, 1, 1⅛, 1¼, 1⅜, 1½	60 00

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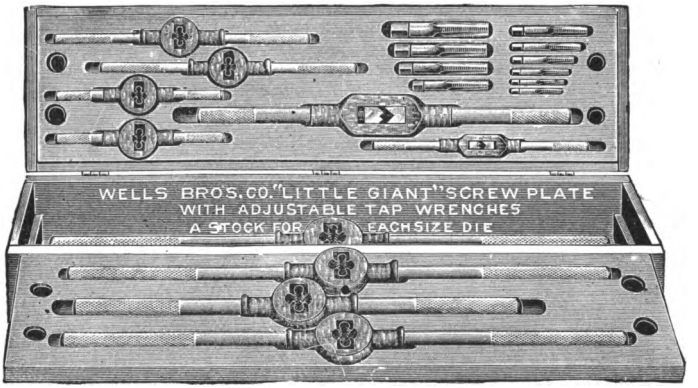
Little Giant FULL STOCKED SCREW PLATES



ASSORTMENT No. 65

Has stock for each size Die. Adjustable Tap Wrench No. 6.

Dies and Taper Taps. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$ **$18 00**



ASSORTMENT No. 67

Has stock for each size Die. Two Adjustable Tap Wrenches, Nos. 5 and 7.

Dies and Taper Taps. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} **$29 50**

LIST OF ASSORTMENTS AND PRICES

Asst. No. 61. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$ **$12 00**

Asst. No. 62. Cutting $\frac{1}{4}^{20}$, $\frac{3}{8}^{16}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$ **15 50**

Asst. No. 63. Cutting $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} **17 00**

Asst. No. 64. Cutting $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} **19 50**

Asst. No. 65. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$ **18 00**

Asst. No. 65½. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$ **20 50**

Asst. No. 66. Cutting $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} **24 00**

Asst. No. 67. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} **29 50**

Asst. No. 67½. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} **32 00**

Asst. No. 620. Cutting $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$ **40 00**

Asst. No. 625. Cutting $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$ **50 00**

Asst. No. 630. Cutting $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$ **43 50**

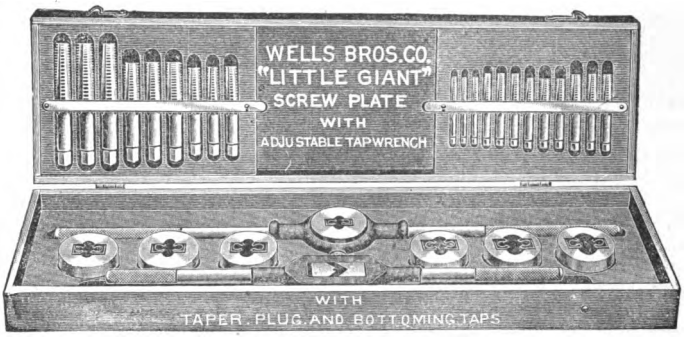
Asst. No. 640. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$ **47 00**

Asst. No. 650. Cutting $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$ **67 00**

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Little Giant. SCREW PLATES

WITH SETS OF MACHINISTS' HAND TAPS



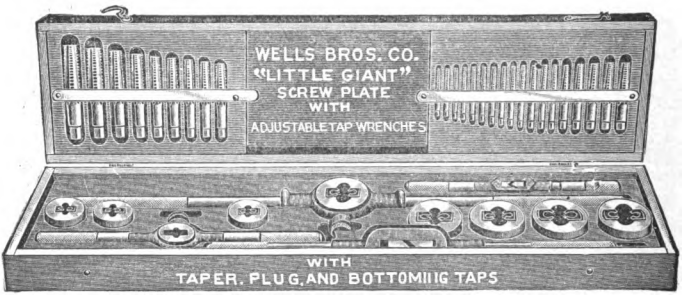
ASSORTMENT NO. 105

Has Stock 23" long. Adjustable Tap Wrench No. 6.

TAPER PLUG AND BOTTOMING HAND TAPS

Dies and Collets 2¾" diam.

Cutting ¼[20], [5]/[16][18], ⅜[16], [7]/[16][14], ½[12], ⅝[11], ¾[10] $22 00



ASSORTMENT NO. 100

Two Stocks 14½" and 29" long. Two Adjustable Tap Wrenches Nos. 5, 7.

TAPER, PLUG AND BOTTOMING HAND TAPS

Dies and Collets of four smaller sizes, 2" diam. Dies and Collets of larger sizes, 2¾" diam.

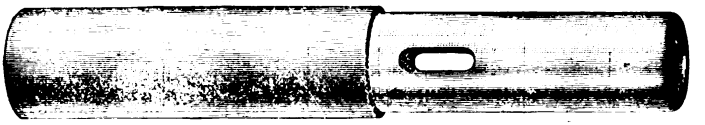
Cutting ¼[20], [5]/[16][18], ⅜[16], [7]/[16][14], ½[12], ⅝[11], ¾[10], ⅞[9], 1[8] $38 00

LIST OF ASSORTMENTS

Asst. No. 101	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½	$15 50
Asst. No. 102	Cutting ¼, ⅜, ½, ⅝, ¾	18 00
Asst. No. 103	Cutting ⅝, ¾, ⅞, 1	22 00
Asst. No. 104	Cutting ½, ⅝, ¾, ⅞, 1	25 00
Asst. No. 105	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, ⅝, ¾	22 00
Asst. No. 105½	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, [9]/[16], ⅝, ¾	25 25
Asst. No. 106	Cutting ⅜, [7]/[16], ½, ⅝, ¾, ⅞, 1	31 25
Asst. No. 107	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, ⅝, ¾, ⅞, 1	36 00
Asst. No. 108	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, ⅝, ¾	24 00
Asst. No. 109	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, ⅝, ¾, ⅞, 1	38 00
Asst. No. 120	Cutting ⅝, ¾, ⅞, 1, 1⅛, 1¼	47 50
Asst. No. 125	Cutting ⅞, 1, 1⅛, 1¼, 1⅜, 1½	63 00
Asst. No. 130	Cutting 1⅛, 1¼, 1⅜, 1½	51 00
Asst. No. 140	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, ⅝, ¾, ⅞, 1, 1⅛, 1¼	55 00
Asst. No. 150	Cutting ¼, [5]/[16], ⅜, [7]/[16], ½, ⅝, ¾, ⅞, 1, 1⅛, 1¼, 1⅜, 1½	84 00

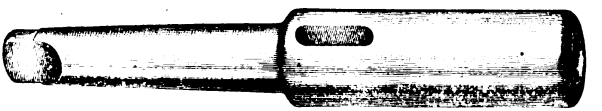
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STEEL SOCKETS FOR TAPER SHANK DRILLS



No. 1. Holds $\frac{1}{4}$ to $\frac{1}{32}$ inches, inclusive, ... $1.20
Entire length, 7 inches; diameter of blank end, $1\frac{1}{8}$ inches.
No. 2. Holds $\frac{5}{8}$ to $\frac{2}{32}$ inches, inclusive, ... 1.80
Entire length, 8 inches; diameter of blank end, $1\frac{1}{4}$ inches.
No. 3. Holds $\frac{15}{16}$ to $1\frac{1}{4}$ inches, inclusive, ... 2.50
Entire length, 10 inches; diameter of blank end, $1\frac{1}{2}$ inches.
No. 4. Holds $1\frac{9}{32}$ to 2 inches, inclusive, ... 4.00
Entire length, 13 inches; diameter of blank end, 2 inches.
No. 5. Holds $2\frac{1}{16}$ to 3 inches, inclusive, ... 7.50
Entire length, 15 inches; diameter of blank end, $2\frac{1}{2}$ inches.
No. 6. Holds $3\frac{1}{16}$ to 4 inches, inclusive, ... 14.00
Entire length, 18 inches; diameter of blank end, 3 inches.

STEEL SOCKETS FOR TAPER SHANK DRILLS



No. 1. With Shank fitted to No. 2 Socket, ... $2.00
No. 1. With Shank fitted to No. 3 Socket, ... 2.50
No. 2. With Shank fitted to No. 3 Socket, ... 2.50
No. 2. With Shank fitted to No. 4 Socket, ... 3.20
No. 3. With Shank fitted to No. 4 Socket, ... 3.20
No. 4. With Shank fitted to No. 5 Socket, ... 4.80
No. 5. With Shank fitted to No. 6 Socket, ... 12.00

STEEL SLEEVES FOR TAPER SHANK DRILLS



No. 1. Fitted to No. 2 Socket, ... $1.80
No. 1. Fitted to No. 3 Socket, ... 2.40
No. 1. Fitted to No. 4 Socket, ... 3.00
No. 2. Fitted to No. 3 Socket, ... 2.40
No. 2. Fitted to No. 4 Socket, ... 3.00
No. 3. Fitted to No. 4 Socket, ... 3.00
No. 4. Fitted to No. 5 Socket, ... 4.40

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NO. 102, INCREASE TWIST DRILLS

WITH TAPER SHANKS

Diam., Inches	Length, Inches	Price, Each	Shank, Taper
1/8	5 1/8	$0 45	No. 1, $1 20
5/64	5 3/8	45	
3/32	5 3/4	50	
7/64	5 7/8	55	
1/8	6 1/8	60	
9/64	6 1/4	65	
5/32	6 3/8	70	
11/64	6 1/2	75	
3/16	6 3/4	80	
13/64	7	85	
7/32	7 1/4	90	
15/64	7 1/2	95	
1/4	7 3/4	1 00	
17/64	8	1 10	
9/32	8 1/4	1 20	
19/64	8 1/2	1 30	No. 2, $1 80
5/16	8 3/4	1 40	
21/64	9	1 50	
11/32	9 1/4	1 60	
23/64	9 1/2	1 70	
3/8	9 3/4	1 85	
25/64	9 7/8	2 00	
13/32	10	2 15	
27/64	10 1/4	2 30	
7/16	10 1/2	2 45	
29/64	10 5/8	2 60	
15/32	10 3/4	$2 75	No. 3, $2 50
31/64	10 7/8	2 90	
1/2	11	3 00	
33/64	11 1/8	3 20	
17/32	11 1/4	3 40	
35/64	11 1/2	3 60	
9/16	11 3/4	3 80	
37/64	11 7/8	4 00	
19/32	12	4 20	
39/64	12 1/8	4 40	
5/8	12 1/4	4 50	
41/64	12 1/2	4 65	No. 4, $4 00
21/32	14 1/8	4 80	
43/64	14 1/4	5 00	
11/16	14 1/2	5 20	
45/64	14 5/8	5 40	
23/32	14 3/4	5 60	
47/64	14 7/8	5 80	
3/4	15	6 00	
49/64	15 1/8	6 30	
25/32	15 1/4	6 60	
51/64	15 3/8	6 90	
13/16	15 1/2	7 20	
53/64	15 5/8	7 50	
27/32	15 3/4	7 80	
55/64	15 7/8	8 10	
7/8	10 3/4	$2 75	No. 4, $4 00
57/64	10 7/8	2 90	
29/32	11	3 00	
59/64	11 1/8	3 20	
15/16	11 1/4	3 40	
61/64	11 1/2	3 60	
31/32	11 3/4	3 80	
63/64	11 7/8	4 00	
1	12	4 20	
1 1/64	12 1/8	4 40	
1 1/32	12 1/4	4 50	
1 3/64	12 1/2	4 65	No. 5, $7 50
1 1/16	14 1/8	4 80	
1 5/64	14 1/4	5 00	
1 3/32	14 1/2	5 20	
1 7/64	14 5/8	5 40	
1 1/8	14 3/4	5 60	
1 9/64	14 7/8	5 80	
1 5/32	15	6 00	
1 11/64	15 1/8	6 30	
1 3/16	15 1/4	6 60	
1 13/64	15 3/8	6 90	
1 7/32	15 1/2	7 20	
1 15/64	15 5/8	7 50	
1 1/4	15 3/4	7 80	
1 17/64	15 7/8	8 10	
1 9/32	16	$8 40	No. 4, $4 00
1 19/64	16 1/8	8 60	
1 5/16	16 1/4	8 80	
1 21/64	16 3/8	9 00	
1 11/32	16 1/2	9 20	
1 23/64	16 5/8	9 35	
1 3/8	16 3/4	9 50	
1 25/64	16 7/8	9 65	
1 13/32	16 1/2	9 80	
1 27/64	16 1/2	10 20	No. 5, $7 50
1 7/16	17	10 60	
1 29/64	17	11 20	
1 15/32	17	12 00	
1 31/64	17 1/2	12 80	
1 1/2	17 1/2	13 60	
1 33/64	18	14 40	
1 17/32	18 1/2	15 00	
1 35/64	19	15 60	
1 9/16	19 1/4	16 20	
1 37/64	19 1/2	16 80	
1 19/32	20	17 60	
1 39/64	20 1/2	19 00	
1 5/8	20 1/2	20 00	
1 41/64	21	21 00	
1 21/32	21	23 00	
1 43/64	22	25 00	

Drills with grinding line furnished on sizes 3/8 and larger when desired.
Sixty-fourth sizes furnished at the price of the next larger size.



NO. 104, STRAIGHT SHANK DRILLS

TAPER SHANK LENGTHS

Diam., Inches	Length, Inches	Length of Shank, Inches	Price, Each
1/16	3 5/8	2 1/8	$0 35
3/32	4 3/8	2 1/2	40
7/64	5 1/8	2 1/2	45
1/8	5 3/8	2 1/2	45
9/64	5 5/8	2 1/2	50
5/32	5 7/8	2 1/2	55
11/64	6 1/8	2 1/2	60
3/16	6 1/4	2 5/8	65
13/64	6 3/8	2 5/8	70
7/32	6 1/2	2 5/8	75
15/64	6 3/4	2 5/8	80
1/4	7	2 3/4	85
17/64	7 1/4	2 3/4	90
9/32	7 1/2	2 3/4	95
19/64	7 3/4	2 3/4	1 00
5/16	8	3	1 10
21/64	8 1/4	3	1 20
11/32	8 1/2	3	1 30
23/64	8 3/4	3	1 40
3/8	9	3 1/4	1 50
25/64	9 1/4	3 1/4	1 60
13/32	9 1/2	3 1/4	1 70
27/64	9 3/4	3 1/4	1 85
7/16	9 7/8	3 1/2	2 00
29/64	10	3 1/2	2 15
15/32	10 1/4	3 1/2	2 30
31/64	10 1/2	3 1/2	2 45
1/2	10 5/8	3 1/4	$2 60
33/64	10 3/4	3 3/4	2 75
17/32	10 7/8	3 3/4	2 90
35/64	11	3 3/4	3 00
9/16	11 1/8	4	3 20
37/64	11 1/4	4	3 40
19/32	11 1/2	4	3 60
39/64	11 3/4	4	3 80
5/8	11 7/8	4 1/4	4 00
41/64	12	4 1/4	4 20
21/32	12 1/8	4 1/4	4 40
43/64	12 1/2	4 1/4	4 50
11/16	14 1/8	4 3/4	4 65
45/64	14 1/4	4 3/4	4 80
23/32	14 3/8	4 3/4	5 00
47/64	14 1/2	4 3/4	5 20
3/4	14 5/8	5	5 40
49/64	14 3/4	5	5 60
25/32	14 7/8	5	5 80
51/64	15	5	6 00
13/16	15 1/8	5 1/4	6 30
53/64	15 1/4	5 1/4	6 60
27/32	15 3/8	5 1/4	6 90
55/64	15 1/2	5 1/4	7 20
7/8	15 5/8	5 1/4	7 50
57/64	15 3/4	5 1/4	7 80
29/32	15 7/8	5 1/4	8 10
59/64	16	5 1/4	$8 40
15/16	16 1/8	5 1/2	8 60
61/64	16 1/4	5 1/2	8 80
31/32	16 3/8	5 1/2	9 00
63/64	16 1/2	5 1/2	9 20
1	16 5/8	5 1/2	9 35
1 1/64	16 3/4	5 1/2	9 50
1 1/32	16 7/8	5 1/2	9 65
1 3/64	16 1/2	5 1/2	9 80
1 1/16	17	6	10 20
1 5/64	17	6	10 60
1 3/32	17	6	11 20
1 7/64	17	6	12 00
1 1/8	17 1/2	6	12 80
1 9/64	17 1/2	6	13 60
1 5/32	18	6	14 40
1 11/64	18 1/2	6	15 00
1 3/16	19	6	15 60
1 13/64	19 1/4	6	16 20
1 7/32	19 1/2	6	16 80
1 15/64	20	6	17 60
1 1/4	20 1/2	6	19 00
1 17/64	20 1/2	6	20 00
1 9/32	21	6	21 00
1 19/64	21	6	23 00
1 5/16	22	6	25 00

Sixty-fourth sizes furnished at the price of the next larger size.
Drills 2 1/64 to 3 have shanks, 1 3/4 inches diameter by 6 inches long.



NO. 104D, TWO GROOVED SHANK DRILLS

Prices and sizes same as No. 104 listed above

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JOBBERS' DRILLS

Nos. 105 and 106



No. 105 Jobbers' and Machinists' Sets				No. 106 Letter Sizes				
Diameter, Inches	Length, Inches	Price, Per Dozen	Price, Each	Diameter	Decimals of 1 Inch	Length, Inches	Price per Dozen	Price, Each
1/64	2 1/2	$1 00	$0 09	A 1/64 inch	.234	3 13/16	$2 90	$0 26
1/32	2 5/8	1 10	10	B	.238	3 13/16	3 00	27
3/64	2 3/4	1 20	11	C	.242	3 13/16	3 10	28
1/16	2 7/8	1 30	12	D	.246	3 15/16	3 20	29
1/8	3	1 45	13	E 1/4 inch	.250	3 15/16	3 30	30
9/64	3 1/8	1 60	15	F	.257	4 1/4	3 40	30
5/32	3 1/4	1 80	16	G	.261	4 1/4	3 50	31
11/64	3 3/8	2 00	18	H 17/64 inch	.266	4 1/4	3 60	32
3/16	3 1/2	2 20	20	I	.272	4 1/4	3 70	33
13/64	3 5/8	2 40	21	J	.277	4 1/4	3 80	34
7/32	3 3/4	2 65	23	K 9/32 inch	.281	4 1/4	3 90	35
15/64	3 7/8	2 90	26	L	.290	4 1/4	4 00	36
1/4	4	3 15	28	M 19/64 inch	.295	4 1/4	4 10	36
17/64	4 1/8	3 40	30	N	.302	4 1/4	4 20	37
9/32	4 1/4	3 65	32	O 5/16 inch	.316	4 1/4	4 30	38
19/64	4 3/8	3 90	35	P 21/64 inch	.323	4 5/8	4 40	39
5/16	4 1/2	4 20	37	Q	.332	4 3/4	4 60	40
21/64	4 5/8	4 50	40	R 11/32 inch	.339	4 3/4	4 80	42
11/32	4 3/4	4 80	42	S	.348	4 7/8	5 00	44
23/64	4 7/8	5 10	45	T 23/64 inch	.358	4 7/8	5 20	45
3/8	5	5 40	48	U	.368	5	5 40	47
25/64	5 1/8	5 70	50	V 3/8 inch	.377	5	5 60	49
13/32	5 1/4	6 00	53	W 25/64 inch	.386	5 1/8	5 80	51
27/64	5 1/8	6 40	55	X	.397	5 1/4	6 00	53
7/16	5 1/2	6 80	59	Y 13/32 inch	.404	5 1/4	6 40	55
29/64	5 5/8	7 20	63	Z	.413	5 3/8	6 80	59
15/32	5 3/4	7 50	65					
31/64	5 7/8	7 75	67					
1/2	6	8 00	70					

For very exact work, a gauge, plainly marked, should accompany the order. Can be furnished straight flute if desired.

No. 105D, TWO-GROOVED SHANK DRILLS

JOBBERS' LENGTH



Prices and sizes same as No. 105 listed above.

STEEL WIRE DRILLS

No. 107



Numbers by Gauge	Approximate Length, Inches	Price, Per Dozen	Price, Each	Numbers by Gauge	Approximate Length, Inches	Price, Per Dozen	Price, Each
1 to 5	4	$2 35	$0 22	31 to 35	2 5/8	$1 40	$0 14
6 to 10	3 11/16	2 25	21	36 to 40	2 7/16	1 25	12
11 to 15	3 1/2	2 10	20	41 to 45	2 1/4	1 10	10
16 to 20	3 1/4	1 95	19	46 to 60	2 1/16 to 1 3/4	95	09
21 to 25	3 1/16	1 75	17	61 to 70	1 1/2	90	08
26 to 30	2 13/16	1 55	15	71 to 80	1 5/16 to 3/4	1 00	09

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BIT STOCK DRILLS

FOR METAL OR WOOD



NO. 109

Diameter Inches	Price, per Dozen	Price each	Diameter Inches	Price, per Dozen	Price each
1/16	$1 50	$0 14	7/16	$8 80	$0 75
3/32	1 65	16	15/32	9 60	82
1/8	2 10	20	1/2	10 30	87
5/32	2 60	24	17/32	11 00	92
3/16	3 10	29	9/16	14 35	1 20
7/32	3 60	33	5/8	16 15	1 35
1/4	4 10	38	11/16	17 95	1 50
9/32	4 70	43	3/4	19 75	1 65
5/16	5 40	48	13/16	21 55	1 80
11/32	6 30	54	7/8	23 35	1 95
3/8	7 20	62	15/16	25 75	2 15
13/32	8 00	68	1	28 15	2 35

Our bit stock drills will fit any brace in the market, and will drill steel, iron or other metals, as well as wood. They are not injured by contact with screws or nails, and will bore any kind of wood without splitting it.

TAPER SQUARE SHANK DRILLS

FITTING RATCHETS



NO. 109E

Diameter, Inches	Length Inches	Price each	Diameter, Inches	Length Inches	Price each
1/8	4 1/4	$0 90	31/32	8 1/4	$2 40
5/32	4 5/8	95	1	8 1/2	2 55
3/16	4 3/4	95	1 1/32	8 3/4	2 70
7/32	4 7/8	1 00	1 1/16	9	2 85
1/4	5	1 00	1 3/32	9	3 00
9/32	5	1 05	1 1/8	9	3 10
5/16	5	1 10	1 5/32	9	3 25
11/32	5	1 15	1 3/16	9	3 35
3/8	6	1 20	1 7/32	9	3 50
13/32	6 1/4	1 25	1 1/4	9	3 65
7/16	6 1/4	1 25	1 9/32	9	3 75
15/32	6 1/4	1 30	1 5/16	9	3 90
1/2	6 1/2	1 30	1 11/32	9	4 05
17/32	6 1/2	1 35	1 3/8	9	4 20
9/16	6 1/2	1 35	1 13/32	9	4 35
19/32	6 1/2	1 40	1 7/16	9	4 50
5/8	6 1/2	1 40	1 15/32	9	4 65
21/32	6 1/2	1 45	1 1/2	9	4 80
11/16	6 1/2	1 45	1 9/16	9	5 10
23/32	6 1/2	1 50	1 5/8	9	5 40
3/4	6 1/2	1 55	1 11/16	9	5 75
25/32	6 1/2	1 65	1 3/4	9	6 10
13/16	7	1 75	1 13/16	9	6 50
27/32	7	1 90	1 7/8	9	6 90
7/8	7 1/2	2 05	1 15/16	9	7 30
29/32	7 3/4	2 20	2	9	7 75
15/16	8	2 30			

Price with shanks 5/8 inch by 3/8 inch and 1 1/8 inches long, and shanks 3/4 inch by 1/2 inch and 1 3/4 inches long. Unless size of shank is stated, we will send drills with shanks 5/8 x 3/8 x 1 1/2 inches long.

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No. 110, COE'S DRILLS

FITTING COE'S BLACKSMITHS' DRILL PRESS AND PRENTICE'S DRILL PRESS No. 3



Diameter, Inches	Length, Inches	Price, Each	Diameter, Inches	Length Inches	Price, Each	Diameter, Inches	Length, Inches	Price, Each
1/8	4 7/8	$0 55	11/16	6	$1 15	1 1/4	6	$2 40
9/64	5 1/8	58	23/32	6	1 20	1 9/32	6	2 50
3/32	5 3/8	60	3/4	6	1 25	1 5/16	6	2 60
7/64	5 5/8	65	25/32	6	1 30	1 11/32	6	2 70
1/4	6	70	13/16	6	1 35	1 3/8	6	2 80
9/32	6	73	27/32	6	1 40	1 13/32	6	2 90
5/16	6	75	7/8	6	1 45	1 7/16	6	3 00
11/32	6	80	29/32	6	1 55	1 15/32	6	3 10
3/8	6	85	15/16	6	1 60	*1 1/2	6	3 20
13/32	6	88	31/32	6	1 70	1 9/16	6	3 40
7/16	6	90	1	6	1 80	1 5/8	6	3 60
15/32	6	93	1 1/32	6	1 90	1 11/16	6	3 80
1/2	6	95	1 1/16	6	2 00	1 3/4	6	4 05
17/32	6	98	1 3/32	6	2 10	1 13/16	6	4 30
9/16	6	1 00	1 1/8	6	2 20	1 7/8	6	4 50
19/32	6	1 03	1 5/32	6	2 25	1 15/16	6	4 75
5/8	6	1 05	1 3/16	6	2 30	2	6	5 00
21/32	6	1 10	1 7/32	6	2 35			

*Discount changes at 1½ inch diameter.

Shanks on these drills are 2¼ inches long, and 41/64 inch (.647 exactly) diameter.

No. 112, SILVER AND DEMING DRILLS

OR SHORT LENGTH BLACKSMITHS' DRILLS

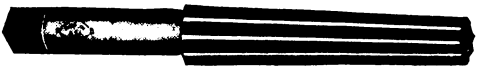


Diameter, Inches	Length, Inches	Price, Each	Diameter, Inches	Length, Inches	Price, Each
1/8	4 7/8	$0 45	27/32	6	$1 40
9/64	5 1/8	48	7/8	6	1 45
3/32	5 3/8	50	29/32	6	1 50
7/64	5 5/8	55	15/16	6	1 60
1/4	6	60	31/32	6	1 70
9/32	6	65	1	6	1 80
5/16	6	70	1 1/32	6	1 90
11/32	6	73	1 1/16	6	2 00
3/8	6	75	1 3/32	6	2 10
13/32	6	78	1 1/8	6	2 20
7/16	6	80	1 5/32	6	2 25
15/32	6	83	1 3/16	6	2 30
1/2	6	85	1 7/32	6	2 35
17/32	6	88	1 1/4	6	2 40
9/16	6	90	1 9/32	6	2 50
19/32	6	95	1 5/16	6	2 60
5/8	6	1 05	1 11/32	6	2 70
21/32	6	1 10	1 3/8	6	2 80
11/16	6	1 15	1 13/32	6	2 90
23/32	6	1 20	1 7/16	6	3 00
3/4	6	1 25	1 15/32	6	3 10
25/32	6	1 30	1 1/2	6	3 20
13/16	6	1 35			

The above drills have shanks 2¼ inches long and ½ inch diameter.

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TAPER REAMERS



No. 118

For Reamer, Taper of Drill Socket No. 0	Price each,	$ 1 60
For Reamer, Taper of Drill Socket No. 1	"	2 00
For Reamer, Taper of Drill Socket No. 2	"	2 60
For Reamer, Taper of Drill Socket No. 3	"	3 40
For Reamer, Taper of Drill Socket No. 4	"	4 20
For Reamer, Taper of Drill Socket No. 5	"	6 60
For Reamer, Taper of Drill Socket No. 6	"	12 00
For Reamer, Taper of Drill Socket No. 7	"	

DIMENSIONS OF TAPER REAMERS

No. of Reamer	Length, Inches	Length of Flute,- Inches	Taper
No. 0	3¾	2¼	.367 by .252
No. 1	5½	3	.517 by .369
No. 2	7	3½	.745 by .572
No. 3	8	4¼	.989 by .778
No. 4	9	5¼	1.290 by 1.020
No. 5	10	6¼	1.801 by 1.475
No. 6	12	8½	2.557 by 2.116
No. 7	16	12	3.373 by 2.750

BIT STOCK TAPER REAMERS



No. 120B

Taper 1 inch to the foot. Diameter at large end of flute is $\frac{1}{16}$ inch larger than nominal size.

Nominal Size, Inches	Whole Length, Inches	Length Flute, Inches	Price each
¼	3⅞	1¾	$0 45
5/16	4	1⅞	50
⅜	4⅛	2	55
7/16	4¼	2⅛	60
½	4⅜	2¼	70
9/16	4½	2⅜	80
⅝	4⅝	2½	90
11/16	4¾	2⅝	1 05
¾	4⅞	2¾	1 20
13/16	5	2⅞	1 45
⅞	5⅛	3	1 65
15/16	5¼	3⅛	1 95
1	5⅜	3¼	2 20
1⅛	5⅝	3½	2 45
1¼	5⅞	3¾	2 70

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JOBBERS' REAMERS



Diameter, Inches.	Price, Each.	Full Length, Inches.	Length of Flutes, Inches.	Diameter, Inches.	Price, Each.	Full Length, Inches.	Length of Flutes, Inches.
1/8	$1.00	3	1 1/2	1 11/32	$5.40	12 17/32	6 17/64
5/32	1.10	3 1/4	1 5/8	1 3/8	5.60	12 5/8	6 5/16
3/16	1.20	3 1/2	1 3/4	1 13/32	5.80	12 23/32	6 23/64
7/32	1.30	3 3/4	1 7/8	1 7/16	6.00	12 1/16	6 1/32
1/4	1.40	4	2	1 15/32	6.20	12 29/32	6 29/64
9/32	1.45	4 1/4	2 1/8	1 1/2	6.40	13	6 1/2
5/16	1.50	4 1/2	2 1/4	1 17/32	6.60	13	6 1/2
11/32	1.55	4 3/4	2 3/8	1 9/16	6.80	13	6 1/2
3/8	1.60	5	2 1/2	1 19/32	7.00	13	6 1/2
13/32	1.70	5 1/4	2 5/8	1 5/8	7.20	13	6 1/2
7/16	1.75	5 1/2	2 3/4	1 21/32	7.40	13 1/2	6 3/4
15/32	1.85	5 3/4	2 7/8	1 11/16	7.60	13 1/2	6 3/4
1/2	1.90	6	3	1 23/32	7.80	13 1/2	6 3/4
17/32	1.95	6 1/4	3 1/8	1 3/4	8.00	13 1/2	6 3/4
9/16	2.00	6 1/2	3 1/4	1 25/32	8.20	13 1/2	6 3/4
19/32	2.10	6 3/4	3 3/8	1 13/16	8.40	13 1/2	6 3/4
5/8	2.20	7	3 1/2	1 27/32	8.60	13 1/2	6 3/4
21/32	2.30	7 11/32	3 43/64	1 7/8	8.80	14	7
11/16	2.40	7 11/16	3 27/32	1 29/32	9.00	14	7
23/32	2.50	8 1/8	4 1/16	1 15/16	9.20	14	7
3/4	2.60	8 3/8	4 3/16	1 31/32	9.40	14	7
25/32	2.70	8 23/32	4 23/64	2	9.60	14	7
13/16	2.80	9 1/16	4 17/32	2 1/16	10.00	14 1/2	7 1/4
27/32	2.95	9 3/8	4 11/16	2 1/8	10.40	14 1/2	7 1/4
7/8	3.10	9 11/16	4 27/32	2 3/16	10.80	15	7 1/2
29/32	3.25	10 3/32	5 3/64	2 1/4	11.30	15	7 1/2
15/16	3.40	10 1/4	5 1/8	2 5/16	11.80	15	7 1/2
31/32	3.55	10 1/16	5 13/32	2 3/8	12.30	15	7 1/2
1	3.70	10 3/8	5 7/16	2 7/16	12.80	15 1/2	7 3/4
1 1/32	3.85	11 1/16	5 17/32	2 1/2	13.40	15 1/2	7 3/4
1 1/16	4.00	11 1/4	5 5/8	2 9/16	14.00	15 1/2	7 3/4
1 3/32	4.15	11 7/16	5 23/32	2 5/8	14.60	16	8
1 1/8	4.30	11 5/8	5 13/16	2 11/16	15.40	16	8
1 5/32	4.45	11 13/16	5 29/32	2 3/4	16.20	16	8
1 3/16	4.60	12	6	2 13/16	17.00	16 1/2	8 1/4
1 7/32	4.75	12 1/8	6 1/16	2 7/8	17.80	16 1/2	8 1/4
1 1/4	4.90	12 1/4	6 1/8	2 15/16	18.60	16 1/2	8 1/4
1 9/32	5.05	12 11/32	6 11/64	3	19.40	16 1/2	8 1/4
1 5/16	5.20	12 7/16	6 7/32				

Reamers of any style, size, or length, made to order; also furnished by 64ths Flutes straight or spiral, as desired.

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SHELL REAMERS

SHELL REAMER.



ROSE SHELL REAMER.



Diameter, Inches.	Price, Each.	Length, Inches.	Size Hole, Inches.
1/4	$1.10	1 1/2	1/8
5/16	1.10	1 1/2	1/8
3/8	1.20	1 3/4	3/16
7/16	1.30	1 3/4	3/16
1/2	1.40	2	1/4
9/16	1.50	2	1/4
5/8	1.60	2 1/4	3/8
11/16	1.60	2 1/4	3/8
3/4	1.60	2 1/2	1/2
13/16	1.60	2 1/2	1/2
7/8	1.70	2 1/2	1/2
15/16	1.70	2 1/2	1/2
1	1.80	2 3/4	5/8
1 1/16	1.80	2 3/4	5/8
1 1/8	1.90	2 3/4	5/8
1 3/16	2.00	2 3/4	5/8
1 1/4	2.20	2 3/4	5/8
1 5/16	2.40	3	3/4
1 3/8	2.60	3	3/4
1 7/16	2.80	3	3/4
1 1/2	3.00	3	3/4
1 9/16	3.20	3	3/4
1 5/8	3.50	3	3/4
1 11/16	3.80	3 1/2	1
1 3/4	4.10	3 1/2	1
1 13/16	4.40	3 1/2	1
1 7/8	4.70	3 1/2	1
1 15/16	5.00	3 1/2	1
2	5.20	3 1/2	1
2 1/16	5.40	3 3/4	1 1/4
2 1/8	5.60	3 3/4	1 1/4
2 3/16	5.80	3 3/4	1 1/4
2 1/4	6.00	3 3/4	1 1/4
2 5/16	6.20	3 3/4	1 1/4
2 3/8	6.40	3 3/4	1 1/4
2 7/16	6.60	3 3/4	1 1/4
2 1/2	6.80	3 3/4	1 1/4
2 9/16	7.00	4	1 1/2
2 5/8	7.30	4	1 1/2
2 11/16	$7.60	4	1 1/2
2 3/4	8.00	4	1 1/2
2 13/16	8.40	4	1 1/2
2 7/8	8.80	4	1 1/2
2 15/16	9.20	4	1 1/2
3	9.60	4	1 1/2
3 1/16	9.90	4 1/2	1 3/4
3 1/8	10.20	4 1/2	1 3/4
3 3/16	10.60	4 1/2	1 3/4
3 1/4	11.00	4 1/2	1 3/4
3 5/16	11.50	4 1/2	1 3/4
3 3/8	12.00	4 1/2	1 3/4
3 7/16	12.50	4 1/2	1 3/4
3 1/2	13.00	4 1/2	1 3/4
3 9/16	13.50	5	2
3 5/8	14.00	5	2
3 11/16	14.50	5	2
3 3/4	15.00	5	2
3 13/16	15.50	5	2
3 7/8	16.00	5	2
3 15/16	17.00	5	2
4	18.00	5	2
4 1/16	18.30	5 1/2	2 1/4
4 1/8	18.60	5 1/2	2 1/4
4 3/16	19.00	5 1/2	2 1/4
4 1/4	19.40	5 1/2	2 1/4
4 5/16	19.80	5 1/2	2 1/4
4 3/8	20.20	5 1/2	2 1/4
4 7/16	20.60	5 1/2	2 1/4
4 1/2	21.00	5 1/2	2 1/4
4 9/16	21.60	6	2 1/2
4 5/8	22.20	6	2 1/2
4 11/16	22.80	6	2 1/2
4 3/4	23.40	6	2 1/2
4 13/16	24.00	6	2 1/2
4 7/8	24.60	6	2 1/2
4 15/16	25.20	6	2 1/2
5	26.00	6	2 1/2

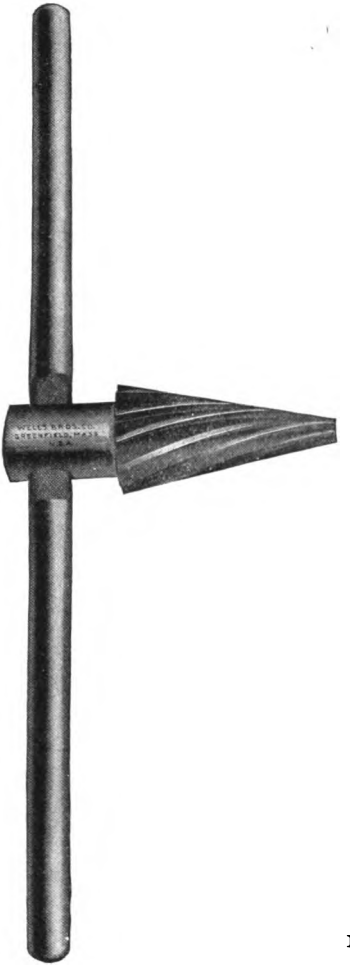
Shell Reamers have taper holes, the diameter given being at the large end.

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Little Giant.

SPIRAL FLUTED BURRING REAMERS

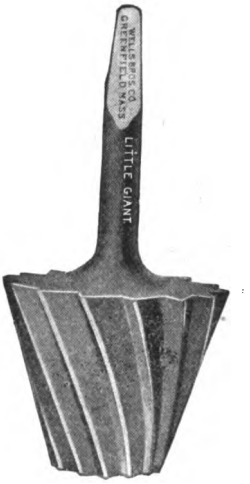
No. 6



No. 2



No. 4



Burrs ought to be removed from all pipe before final placing. These tools do it and make a clean cut.

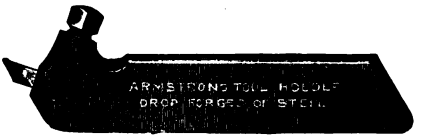
LIST OF SIZES

Order by this No.	Total Length	Length of Flute	Length of Shank	Size at Point	Size at Large End	Style of Shank	Capacity Pipe	Price
No. 1	2¾	1	1¾	7/32	¾	Bit Brace	⅛ to ½	$1 00
No. 2	3¾	1⅝	2⅛	7/16	1¼	Bit Brace	½ to 1	1 25
No. 3	3¾	1⅝	2⅛	7/16	1¼	½ or 41/64 Round Shank	½ to 1	1 25
No. 4	4⅝	2	2⅝	1	2 3/16	Bit Brace	1 to 2	3 00
No. 5	3¾	2	1¾	1	2 5/32	T Handle 20 in. Long	1 to 2	3 50
No. 6	6 7/16	4¼	2 3/16	7/16	2 5/32	T Handle 20 in. Long	½ to 2	4 00

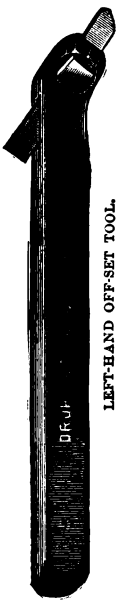
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ARMSTRONG PATENT TOOL HOLDERS.

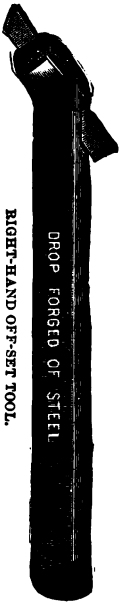
STRAIGHT-SHANK TOOL HOLDERS.



Complete with drop forged wrench and two self-hardening steel cutters, ground to shape.



No.	Size of Holder. Inches.	Size of Cutter. In. Sq.	Weight. Lbs.	Weight. Oz.	Price. Complete.	Extra Cutters. Each.
00	5/16 x 5/8 x 4 1/2	3/16	0	7	$1.60	$.10
0	3/8 x 3/4 x 5	1/4	0	12	1.65	.12
1	1/2 x 1 x 6	5/16	1	4	1.80	.18
2	5/8 x 1 1/4 x 7	3/8	2	0	2.30	.25
3	3/4 x 1 1/2 x 8	7/16	3	4	3.00	.35
4	7/8 x 1 5/8 x 9	1/2	4	8	3.80	.45
5	1 x 1 3/4 x 11	5/8	7	8	4.75	.65
6	1 1/4 x 2 x 13	3/4	11	8	7.00	1.00
7	1 1/2 x 2 1/4 x 16	7/8	19	8	12.00	1.75
750	1 5/8 x 2 1/2 x 18	1	25	0	17.50	2.50
800	1 3/4 x 2 3/4 x 20	1 1/8	37	0	23.00	3.25



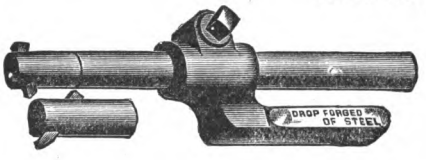
OFF-SET TOOL HOLDERS.

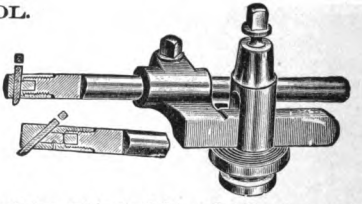
Complete with drop forged wrench and two self-hardening steel cutters, ground to shape.

No. Right or Left.	Size of Holder. Inches.	Size of Cutter. In. Sq.	Weight. Lbs.	Weight. Oz.	Price. Complete.	Extra Cutters. Each.
00	5/16 x 5/8 x 5	3/16	0	8	$1.60	$.10
0	3/8 x 3/4 x 6	1/4	0	14	1.65	.12
1	1/2 x 1 x 8	5/16	1	10	1.80	.18
2	5/8 x 1 1/4 x 9	3/8	2	8	2.30	.25
3	3/4 x 1 1/2 x 10	7/16	4	0	3.00	.35
4	7/8 x 1 5/8 x 11	1/2	5	10	3.80	.45
5	1 x 1 3/4 x 12 1/2	5/8	8	4	4.75	.65
6	1 1/4 x 2 x 15	3/4	12	8	7.00	1.00
7	1 1/2 x 2 1/4 x 20	7/8	24	4	12.00	1.75
750	1 5/8 x 2 1/2 x 22	1	30	0	17.50	2.50
800	1 3/4 x 2 3/4 x 24	1 1/8	41	0	23.00	3.25

NOTE. — In ordering always specify whether right or left hand is wanted. We will always send straight shank, as listed above, if right or left is not mentioned.

BORING TOOL.





Each set is put up in a neat box. It consists of holder and bar with straight and 45° end caps, two cutters (ground for boring), wrench and a piece of self-hardening steel, about enough for ten extra cutters.

No.	Size of Shank.	Size of Bar.	Size of Cutter.	Weight.	Price Complete.	Extra Cutters.
C0B	5/16 x 5/8 inch.	1/2 in. diam.	3/16 in. square.	1 lb. 12 oz.	$3.00	$.12 each.
8	3/8 x 3/4 "	5/8 "	3/16 "	2 " 0 "	3.00	.12 "
9	1/2 x 1 "	3/4 "	1/4 "	4 " 0 "	3.60	.15 "
10	5/8 x 1 1/4 "	15/16 "	5/16 "	7 " 5 "	4.75	.20 "
11	3/4 x 1 1/2 "	1 1/8 "	3/8 "	12 " 5 "	6 75	.30 "
12	7/8 x 1 5/8 "	1 5/16 "	7/16 "	17 " 12 "	10.00	.40 "

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THE ARMSTRONG SIDE TOOLS.

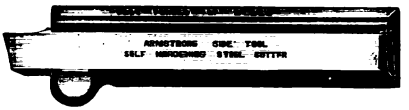


Left Hand Off-Set Side Tool.



Right Hand Off-Set Side Tool.

No Forging.
Little Grinding.
Correct Design.



Will do as heavy work as any forged tool of same size.

Right Hand Straight Shank Side Tool.

Price List of Armstrong Off-Set Side Tools.

Complete with Drop Forged Wrench and one Self-Hardening Steel Cutter, ground to shape.

No. Left Hand.	No. Right Hand.	Size of Shank.	Size of Cutter.	Price Complete	Extra Cutters
70-L	70-R	3/8 x 7/8 inch	7/32 x 5/8 x 4½ inch	$2.20	$0.45
71-L	71-R	½ x 1⅛ inch	¼ x ¾ x 5 inch	2.40	.50
72-L	72-R	⅝ x 1⅜ inch	5/16 x 1 x 6 inch	3.00	.75
73-L	73-R	¾ x 1⅝ inch	⅜ x 1¼ x 7 inch	3.90	1.15
74-L	74-R	⅞ x 1⅞ inch	7/16 x 1⅜ x 8 inch	4.90	1.35
75-L	75-R	1 x 2⅛ inch	½ x 1½ x 9 inch	6.50	1.85
76-L	76-R	1¼ x 2¼ inch	9/16 x 1⅝ x 10 inch	8.50	2.50



Price List of Armstrong Straight Shank Side Tools.

Complete with Drop Forged Wrench and one Self-Hardening Steel Cutter, ground to shape.

No. Left Hand.	No. Right Hand.	Size of Shank.	Size of Cutter.	Price Complete.	Extra Cutters
82-L	82-R	⅝ x 1¼ x 6 in.	¼ x ¾ x 6½ in.	$3.00	$0.65
83-L	83-R	¾ x 1½ x 7½ in.	5/16 x 1 x 8 in.	3.90	1.15
84-L	84-R	1 x 1¾ x 9 in.	⅜ x 1¼ x 9½ in.	4.90	1.35
85-L	85-R	1⅛ x 2 x 11 in.	7/16 x 1⅜ x 11½ in.	6.50	1.85
86-L	86-R	1¼ x 2¼ x 13 in.	½ x 1½ x 13½ in.	8.50	2.50
87-L	87-R	1½ x 2⅜ x 15 in.	9/16 x 1⅝ x 15½ in.	12.00	3.75

ARMSTRONG SLOTTER TOOLS.

Complete with Drop Forged Wrench and two Self-Hardening Steel Cutters, ground to shape.

NOTE—As there is considerable differenee in size of the T slots of machines of different manufacture, the clamps and bolt heads of this tool are made of ample size to allow for fitting.

No.	For Slotter.	Diameter of Bar.	Length Over All	Size of Cutter.	Weight	Price Complete	Extra Cutters
91	6 and 8 in.	1½ in.	16 in.	7/16 x 9/16 in.	30 lbs	$20.00	$0.50
92	10 and 12 in.	2 in.	22 in.	½ x 11/16 in.	45 lbs	30.00	.65
93	14 and 16 in.	2¼ in.	27 in.	9/16 x ¾ in.	65 lbs	45.00	.85
94	18 and 20 in.	2½ in.	32 in.	⅝ x ⅞ in.	95 lbs	65.00	1.15
95	22 and 24 in	2¾ in.	37 in.	¾ x 1 in.	130 lbs	95.00	2.00

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NICHOLSON FILES

PRICE LIST OF FILES AND RASPS.

LIST OF NOV. 1, 1899. As Adopted by the File Manufacturers' Association of the United States, Nov. 1, 1899. PRICE PER DOZEN.

Size, Inches	MILL AND ROUND			FLAT			SQUARE			HAND AND PILLAR			HALF ROUND AND THREE SQUARE			WARDING		
	Bastard	Second Cut	Smooth	Bastard	Second Cut	Smooth	Bastard	Second Cut	Smooth	Bastard	Second Cut	Smooth	Bastard	Second Cut	Smooth	Bastard	Second Cut	Smooth
4	$3 00	$3 50	$3 90	$3 70	$4 30	$4 70	$3 80	$4 60	$4 90	$3 70	$4 30	$4 80	$4 80	$5 60	$6 10	$4 00	$4 80	$5 40
5	3 20	3 80	4 10	3 90	4 60	4 90	4 10	4 80	5 30	3 90	4 70	5 30	5 40	6 10	6 40	4 50	5 30	5 80
6	3 50	4 00	4 50	4 30	4 80	5 30	4 60	5 10	5 50	4 30	5 10	5 60	6 10	6 70	7 10	4 90	5 90	6 40
7	3 90	4 60	4 90	4 80	5 50	6 10	5 10	5 80	6 30	4 90	5 80	6 30	7 00	7 70	8 20	5 90	6 90	7 50
8	4 30	4 90	5 40	5 30	6 10	6 60	5 50	6 30	7 00	5 40	6 30	6 70	7 50	8 30	8 90	6 40	7 50	8 20
9	4 90	5 80	6 30	6 30	7 20	7 90	6 60	7 70	8 30	6 70	7 80	8 30	8 50	9 40	9 90	7 80	9 00	9 90
10	5 60	6 40	7 00	7 00	8 10	8 70	7 40	8 50	9 10	7 50	8 70	9 40	9 10	10 10	10 70	9 70	10 10	11 00
11	6 70	7 80	8 50	8 60	9 80	10 70	9 10	10 40	11 30	9 40	10 90	11 80	10 70	11 80	12 70	10 90	12 70	13 70
12	7 50	8 60	9 40	9 70	11 00	12 10	10 20	11 50	12 80	10 70	12 30	13 50	11 80	13 00	13 90	12 30	14 30	15 40
13	9 40	10 70	11 70	11 80	13 60	14 70	12 50	14 30	15 40	13 30	15 20	16 20	14 10	15 40	16 60	15 20	17 40	18 70
14	10 70	12 20	13 10	13 30	15 30	16 70	13 90	16 10	17 50	15 00	17 00	18 20	15 50	17 00	18 30	17 00	19 40	21 00
15	13 10	15 00	16 10	16 00	18 30	20 00	16 90	19 20	20 90	17 90	20 60	21 70	18 50	20 40	21 70			
16	14 70	16 80	17 90	17 80	20 10	22 30	18 70	21 20	23 30	20 10	22 80	24 20	20 60	22 50	24 20	STAVE SAW		
17	18 20	20 20	21 70	21 50	24 20	26 50	22 50	25 40	27 50	24 20	27 10	28 60	24 70	27 00	28 90			
18	20 20	22 70	24 30	23 90	26 80	29 20	25 10	28 20	30 40	26 80	29 90	31 50	27 50	29 90	32 00	8 inch.... .$9 40		
19	24 60	27 50	29 40	28 40	31 60	34 60	29 70	33 20	35 70	31 90	35 40	37 60	32 80	35 70	38 10			
20	27 40	30 70	32 90	31 50	35 30	38 30	32 80	36 70	39 30	35 10	39 20	41 60	36 20	39 40	42 30	STAVE SAW IMPROVED		
	Mill, blunt, double cut, advance 2 in. Mill, double cut, advance 1 in. Mill, narrow point, advance 1 in.			Cant (blunt), double cut, advance 2 in.			Square blunt, advance 1 in. Parallel, one safe side, advance 1 in.			Slotting (blunt), advance 2 in. Cotter, blunt or taper, advance 2 in.			Ginsaw, take bastard price Crossing, advance 2 in. Tumbler, advance 2 in. Feather Edge, blunt, advance 2 in. High Back } advance Half Round } 2 in.			6 inch $6 40 7 inch 7 40 8 inch 8 10 9 inch 9 70 10 inch 10 70 12 inch 15 40		

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Size, Inches	MILL One Round Edge			MILL Two Round Edges.			TAPERS		SLIM TAPERS		BAND SAW Blunt and Taper		PIT SAW	CANT SAW	GT. AM. CROSS CUT	PLANER KNIFE
	Bastard	Second Cut	Smooth	Bastard	Second Cut	Smooth	Single Cut	Double Cut	Single Cut	Double Cut	Regular	Slim	Single Cut	Single Cut	Single Cut	Single Cut
3							$2 10	$2 50	$2 10	$2 50	$2 50	$2 50	...			
3½							2 10	2 50	2 10	2 50	2 50	2 50	..			
4	$3 40	$3 90	$4 40	$3 80	$4 40	$4 90	2 20	2 90	2 20	2 60	2 90	2 60	$4 80	$4 30	$4 80	
4½							2 40	3 10	2 30	3 00	3 10	3 00				
5	3 60	4 30	4 60	4 00	4 80	5 10	2 60	3 50	2 50	3 20	3 50	3 20	5 40	4 70	5 40	
5½							3 00	4 00	2 90	3 50	4 00	3 50				
6	3 90	4 50	5 10	4 40	5 00	5 60	3 40	4 70	3 10	3 90	4 70	3 90	6 10	5 40	6 10	
7	4 40	5 20	5 50	4 90	5 80	6 10	4 30	5 60	3 80	4 50	5 60	4 50	7 00	6 10	7 00	
8	4 80	5 50	6 10	5 40	6 10	6 80	5 40	6 70	4 50	5 30	6 70	5 30	7 50	6 40	7 50	$6 40
9	5 50	6 50	7 10	6 10	7 30	7 90	6 60	8 10	5 40	6 30	8 10	6 30	8 50	7 80	8 50	
10	6 30	7 20	7 90	7 00	8 00	8 80	8 10	9 70	6 40	7 50	9 70	7 50	9 10	8 70	9 10	8 60
11	7 50	8 80	9 60	8 40	9 80	10 60	10 70	12 10	8 30	9 10	12 10	9 10	10 70	10 40	10 70	
12	8 40	9 70	10 60	9 40	10 80	11 80	12 50	14 70	9 50	11 00	14 70	11 00	11 80	11 40	11 80	12 10
13	10 60	12 00	13 20	11 80	13 40	14 60	15 90	17 50	12 10	13 10	17 50	13 10				
14	12 00	13 70	14 70	13 40	15 30	16 40	18 20	20 60	13 80	15 40	20 60	15 40				
15	14 70	16 90	18 10	16 40	18 80	20 10										
16	16 50	18 90	20 10	18 40	21 00	22 40										
17	20 50	22 70	24 40	22 80	25 30	27 10										
18	22 70	25 50	27 30	25 30	28 40	30 40										

DOUBLE-ENDED TAPER				
6	7	8	9	10
$3 50	3 50	3 90	4 40	4 90

Size, Inches	WOOD FILES			WOOD RASPS			SHOE RASPS		KNIFE		
	Flat	Half Round	Cabinet	Flat	Half Round	Cabinet	Flat	Half Round	Bastard	Second Cut	Smooth
4									$5 40	$6 10	$6 40
5									6 10	6 70	7 10
6	$4 30	$6 10	$8 10	$7 40	$8 10	$10 10	$8 10	$8 10	6 90	7 50	7 90
7	4 80	7 00	9 30	8 60	9 30	11 70	9 30	9 30	7 80	8 50	8 90
8	5 30	7 50	10 10	9 40	10 10	12 80	10 10	10 10	8 50	9 10	9 50
9	6 30	8 50	12 20	11 40	12 20	15 50	12 20	12 20	9 40	10 60	11 30
10	7 00	9 10	13 70	12 80	13 70	17 50	13 70	13 70	10 10	11 50	12 30
11	8 60	10 70	16 80	15 50	16 80	20 70	16 80	16 80	12 20	13 70	14 60
12	9 70	11 80	18 70	17 50	18 70	22 80	18 70	18 70	13 70	15 20	16 10
13	11 80	14 10	22 40	20 90	22 40	26 80	22 40	22 40	16 30	17 90	19 20
14	13 30	15 50	24 80	23 20	24 80	29 60	24 80	24 80	18 20	19 90	21 20
15	16 00	18 50	29 70	27 80	29 70	33 90					
16	17 80	20 60	32 90	30 80	32 90	36 90		...			
17	21 50	24 70	38 90	36 20	38 90	42 40					
18	23 00	27 50	43 60	40 90	43 60	46 90					

Sizes below 4 inches, not extended, take 4-inch price.

Half inches, not specified, take next higher full inch price

Dead Smooth, double the price of Bastard Cut.

One Round Edge, not specified, advance 12½ per cent.

All lengths above those listed, advance 20 per cent on next lower inch price.

Blunt Files, not specified, advance 1 inch on respective kinds and cuts.

Single or Float Cut, not specified, on regular shapes take Double Cut price.

Equalings (Bellied), advance 2 inches on respective kinds and cuts.

Two Round Edges, not specified, advance 25 per cent.

Files varying from standard sizes, subject to special prices.

Cuts not specified, made upon regular blanks, advance 1 inch on respective kinds and nearest cut.

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BLACK DIAMOND FILES.

TAPER SAW FILES.



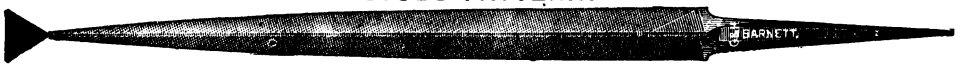
SLIM TAPER SAW FILES.



DOUBLE ENDED TAPERS.



STUBS PATTERN.



BLUNT SAW FILES.



BAND SAW FILES.



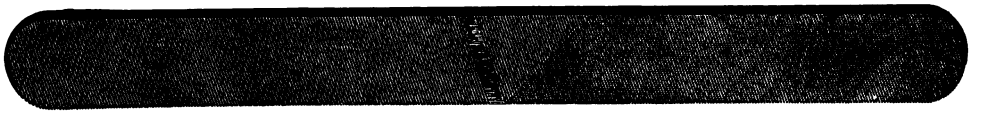
LIGHTNING SAW FILES.



GREAT AMERICAN SAW FILES.



PLANER KNIFE FILES.



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BLACK DIAMOND FILES—CONTINUED.

MILL BASTARD—SQUARE AND ROUND EDGES.



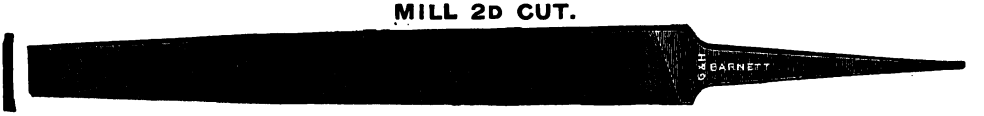
MILL BASTARD—ROUND EDGES.



MILL BASTARD—SQUARE EDGES.



MILL 2D CUT.



WARDING BASTARD.



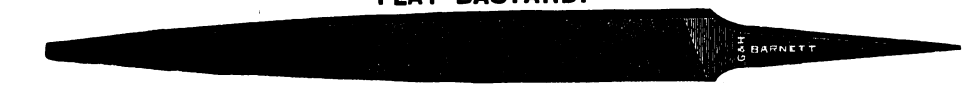
WARDING 2D CUT.



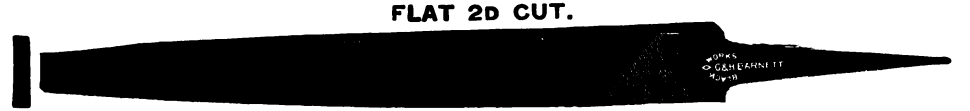
WARDING SMOOTH.



FLAT BASTARD.



FLAT 2D CUT.



FLAT SMOOTH.



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FILES—CONTINUED.

HAND BASTARD.



HAND 2D CUT.



HAND SMOOTH.



PILLAR BASTARD.



PILLAR 2D CUT



PILLAR SMOOTH.



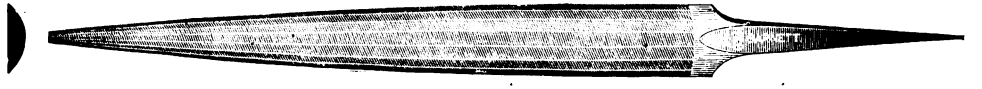
HALF ROUND BASTARD.



HALF ROUND 2D CUT.



HALF ROUND SMOOTH.



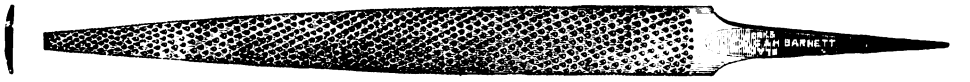
HALF ROUND CAB. FILES.



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FILES—CONTINUED.

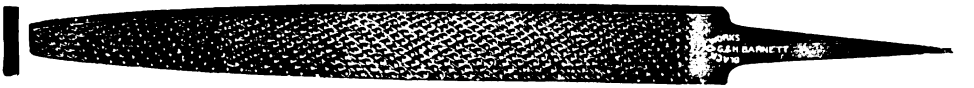
HALF ROUND CABINET RASPS.



HALF ROUND WOOD RASPS.



FLAT WOOD RASPS.



FLAT WOOD FILE.



CROSSING BASTARD.



PIT SAW FILES.



SQUARE BASTARD.



SQUARE 2D CUT.



SQUARE SMOOTH.



ROUND BASTARD.



ROUND 2D CUT.



ROUND SMOOTH.



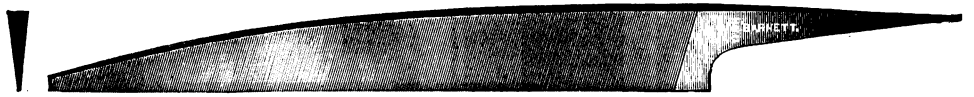
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FILES—CONTINUED.

KNIFE BASTARD.



KNIFE 2D CUT.



KNIFE SMOOTH.



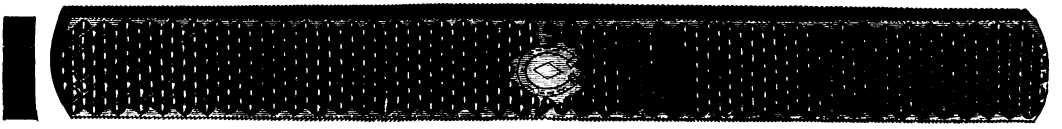
AUGER BIT FILES.



FEATHER EDGE BASTARD.



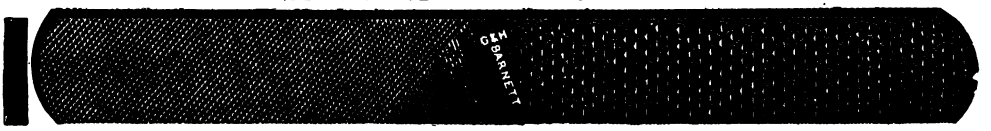
HORSE RASP—½ FILE.



TANGED HORSE RASP—½ FILE.



HALF ROUND SHOE RASP—¼ FILE.



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HACK SAW BLADES.

Sterling.

FOR USE IN HAND FRAMES.

	6-in.	7-in.	8-in.	9-in.	10-in.	11-in.	12-in.
½ inch wide, per gross....	$6 60	$7 20	$7 80	$8 40	$10 00	$11 00	$12 00

FOR POWER MACHINES.

	10-in.	11-in.	12-in.	14-in.	17-in.	20-in.
⅝ inch wide, per gross....	$10 20	$11 40	$12 60	$15 00		
¾ inch wide, per gross....			15 00	18 00		
1 inch wide, per gross.....					$36 00	$38 00

Standard size teeth, for machinists' use.....15 teeth to inch
Fine size teeth, for Brass, Aluminum and coarse tubing.....24 teeth to inch
Extra fine size teeth, for tubing finer than 20 gauge 32 teeth to inch

"STERLING" HACK SAW FRAMES.

SOLID FRAMES.

No. 10. Malleable (not cast) Iron, strong and serviceable. Fine Black Enamel Finish, per dozen..... 8-in. $3 75; 9-in. $4 00

No. 20. 2⅓ in. deep, polished Steel, without blade, per dozen..... 8-in. $6 00; 9-in. $6 30; 10-in. $6 60; 12-in. $7 20

No. 2. Steel, Nickeled, without blade, per doz. $8 40 $8 70 $9 00 $9 60
8-inch, 9-inch, 10-inch—3½ inches deep; 12-inch—2½ inches deep.

No. 30. 5½ in. deep, extra weight steel frames, ⅞x¼ in. 12-in. 14-in.
Not Nickeled, without blade..... $16 00 $18 00
Nickeled, without blade..... 18 00 20 00

RAILROAD TRACK SAW FRAMES.

"POLISHED STEEL."

		Frames only, per doz.
No. 55.	Depth 7¼ in. for 12-in. blades	$19 50
No. 56.	Depth 7¼ in. for 14-in. blades	20 50
No. 57.	Depth 10¼ in. for 12-in. blades	21 50
No. 58.	Depth 10¼ in. for 14-in. blades	22 50

"NICKELED."

		Frames only, per doz.
No. 60.	Depth 7¼ in. for 12-in. blades	$22 00
No. 65.	Depth 7¼ in. for 14-in. blades	23 00
No. 70.	Depth 10¼ in. for 12-in. blades	24 00
No. 75.	Depth 10¼ in. for 14-in. blades	25 00

N. B.—The above are all steel forged frames, made from stock 1 in. x ¼ in.

ADJUSTABLE.

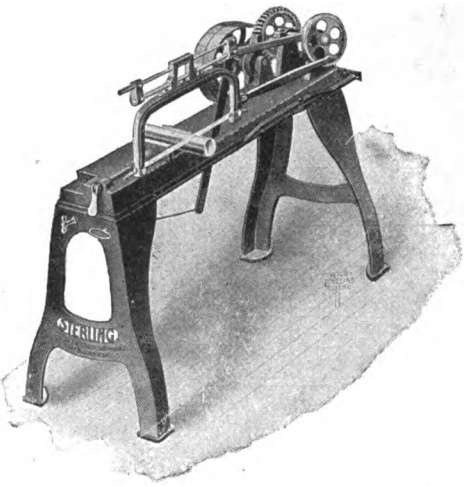
Takes 8-inch to 12-inch blade.

No. 40. Polished.....$ 9 00
No. 50. Nickeled..... 12 00



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"STERLING" POWER HACK SAW MACHINES.



NEW FEATURES OF THE "STERLING" POWER HACK SAW.

1st. Gear Driven.

2nd. Tight and Loose Pulley.

3rd. Automatic Shut-off. (Saw stopped on backward stroke.)

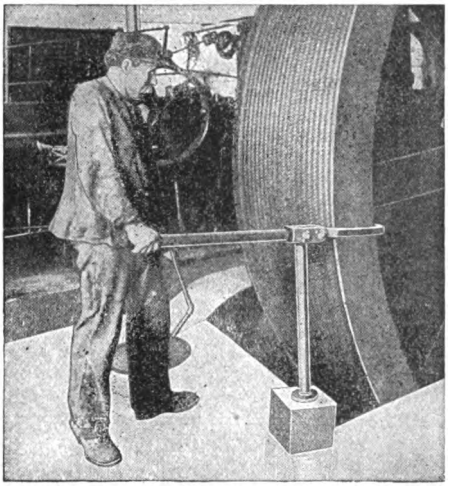
4th. Gravity Feed.

5th. Pinion Gear and Driving Shaft Bearings Cast on Bed.

Machine No. 1, takes 10-inch and 12-inch blades. Price $25 00
Machine No. 2, takes 14-inch blades Price 30 00

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THE CHICAGO ENGINE JACK

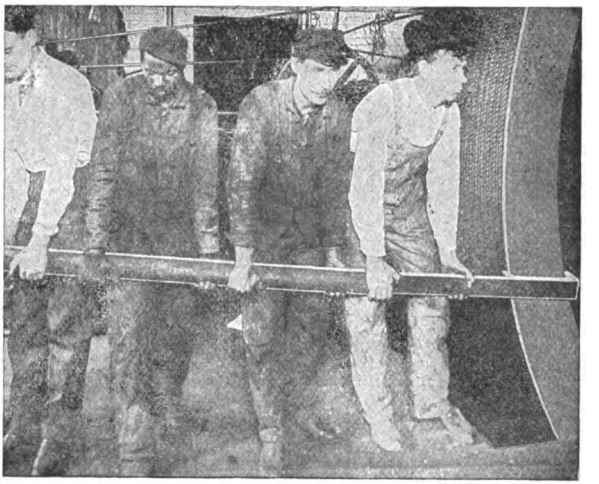


With this Jack, the engineer can turn his engine off center by his own efforts alone; with the plain bar he must have the assistance of one or several men, according to the size of the engine.

The Chicago Jack gives the same grip on the fly-wheel rim edge as the old style plain bar, and by powerful leverage enables the engineer to move the wheel easily and rapidly by successive "bites," which may keep the wheel in motion. The plain bar is not so easily handled, being not only heavy but slow and clumsy as well.

The leverage in the Chicago Jack can be made proportionate to the size of the engine and the force consequently necessary to move it.

The instant availability of the Chicago Jack removes all terrors from the inevitable occurrence of getting caught on center in stopping the engine at quitting time, when all assistants are leaving and the engineer is helpless unless he can turn the engine alone.



THE OLD WAY

The Chicago Jack is useful in valve setting, when the engine is wanted turned from center to center. This Jack not only makes the turning easy, but also provides means for quickly placing the engine exactly on either center.

All castings are made of crucible steel, the whole being carefully constructed and finished in a thorough workmanlike manner.

Price, complete.....$50 00

Subject to discount.

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CIRCULAR SAWS



Diameter, Inches.	Thickness Gauge.	Size of Hole, Inch.	Price, each.	Extra for Additional Gauge (heavier).	Price for Beveling New Saws (grinding or beveling old saws extra). Per Gauge.	Extra for Setting and Sharpening Rip Saw.	Extra for Setting and Sharpening Cross-cut Saw.	Diameter, Inches.	Thickness Gauge.	Size of Hole, Inch.	Price, each.	Extra for Additional Gauge (heavier).	Price for Beveling New Saws (grinding or beveling old saws extra). Per Gauge.	Extra for Setting and Sharpening Rip Saw.	Extra for Setting and Sharpening Cross-cut Saw.
1	24	3/8	$ 0 55	$0 01	$0 06	$0 15	$0 20	32	10	1 5/8	$22 00	$ 1 00	$1 40	$1 40	$2 05
1½	24	3/8	60	01	07	17	23	34	9	1 5/8	25 00	1 20	1 55	1 60	2 35
2	23	3/8	65	01½	08	18	25	36	9	1 5/8	28 00	1 40	1 70	1 70	2 55
2½	22	3/8	70	02	09	20	28	38	9	1 5/8	31 00	1 75	1 85	1 85	2 75
3	21	½	75	02	10	21	30	40	9	2	36 00	2 00	2 00	2 00	2 95
3½	20	½	85	03	12	23	32	42	8	2	42 00	2 50	2 20		3 15
4	19	¾	1 10	03	14	25	35	44	8	2	50 00	3 00	2 40		3 35
5	19	¾	1 30	04	16	28	40	46	8	2	60 00	3 50	2 60		3 60
6	18	¾	1 55	05	18	30	45	48	8	2	70 00	4 00	2 80		3 80
7	18	¾	1 85	06	20	33	50	50	7	2	80 00	4 50	3 00		4 10
8	18	⅞	2 20	08	22	35	55	52	7	2	90 00	5 00	3 25		4 40
9	17	⅞	2 75	10	25	40	60	54	7	2	100 00	6 00	3 50		4 70
10	16	1	3 30	12	28	45	65	56	7	2	115 00	7 00	3 75		5 00
11	16	1	3 80	14	30	48	70	58	7	2	130 00	8 00	4 05		5 30
12	15	1	4 15	17	35	50	75	60	6	2	145 00	9 00	4 35		5 60
14	15	1⅛	5 00	21	40	60	85	62	6	2	160 00	10 00	4 65		6 00
16	14	1⅛	6 00	25	50	65	95	64	6	2	180 00	12 00	5 00		6 30
18	13	1¼	7 50	30	60	70	1 05	66	6	2	200 00	15 00	5 35		6 60
20	13	1 5/16	9 00	35	70	80	1 15	68	5	2	225 00	18 00	5 75		6 90
22	12	1 5/16	11 00	45	80	90	1 30	70	5	2	255 00	21 00	6 15		7 20
24	11	1⅜	13 00	55	90	1 00	1 45	72	5	2	290 00	24 00	6 55		7 50
26	11	1⅜	15 00	65	1 05	1 10	1 60	74	5	2	330 00	27 00	7 00		7 75
28	10	1½	17 00	80	1 20	1 20	1 75	76	5	2	375 00	30 00	7 50		8 00
30	10	1½	19 00	90	1 30	1 30	1 95								

No extra charge for Saws one gauge thicker than list.

Circular Saws 48 inches and larger, if made thinner than 10 gauge are not warranted, and add 10 per cent for each gauge thinner than No. 10.

Circular Saws 42 inches and less in diameter, beveled one gauge without extra charge; 44 inches and larger beveled two gauges without extra charge.

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ATKINS INSERTED TOOTH SAWS

CHISEL TOOTH No. 3

THE BEST TOOTH FOR HARD WOOD

Diameter, Inches	Thickness, Gauge	Standard Number of Teeth	Size of Hole, Inches	Price, Each	Extra for Each Additional Gauge Heavier than Standard	Price for Beveling New Saws, per Gauge
12	11	10	1	$ 18 00	$ 0 17	$0 35
14	11	10	1 1/8	21 00	21	40
16	11	12	1 1/8	24 00	25	50
18	11	14	1 1/4	27 00	30	60
20	11	14	1 5/16	31 00	35	70
22	11	16	1 5/16	35 00	45	80
24	11	18	1 3/8	39 00	55	90
26	10	18	1 3/8	43 00	65	1 05
28	10	20	1 1/2	47 00	80	1 20
30	10	20	1 1/2	52 00	90	1 30
32	9	22	1 5/8	57 00	1 00	1 40
34	9	22	1 5/8	62 00	1 20	1 55
36	8	24	1 5/8	68 00	1 40	1 70
38	8	24	1 5/8	73 00	1 75	1 85
40	8	26	2	80 00	2 00	2 00
42	8	28	2	86 00	2 50	2 20
44	7	30	2	95 00	3 00	2 40
46	7	30	2	103 00	3 50	2 60
48	7	32	2	113 00	4 00	2 80
50	7	34	2	127 00	4 50	3 00
52	6	36	2	148 00	5 00	3 25
54	6	38	2	165 00	6 00	3 50
56	6	40	2	190 00	7 00	3 75
58	6	42	2	210 00	8 00	4 05
60	5	42	2	230 00	9 00	4 35
62	5	44	2	250 00	10 00	4 65
64	5	44	2	275 00	12 00	5 00
66	5	48	2	300 00	15 00	5 35
68	5	48	2	325 00	18 00	5 75
70	4	52	2	355 00	21 00	6 15
72	4	52	2	390 00	24 00	6 55

Ten extra sets of points given with each saw, whether new or altered from a solid tooth.

For each additional tooth inserted add $1 50 each. Duplicate No. 3 holders, 40 cents each. Duplicate No. 3 points, $4 80 per hundred. Wrenches, $1 00 each.

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ATKINS SHINGLE SAWS

FOR EVERY MAKE SHINGLE MACHINE

TAPERED AND PATENT GROUND



WHEN ORDERING SHINGLE SAWS, GIVE FOLLOWING SPECIFICATIONS:

Diameter of saw (in inches). Thickness or gauge at center. Thickness or gauge at rim. Number of teeth. Right or left hand. Speed.

If you wish us to furnish the flange, give maker's name of machine, or send full and correct templet of old flange, giving size and location of holes.

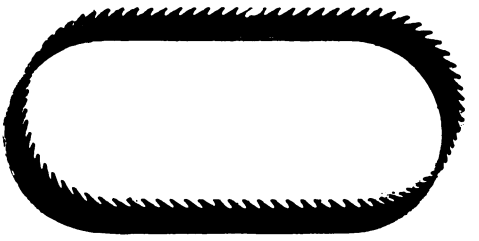
If you have flange and we are to furnish the saw only, send it to us that we may fit it to the saw, or if you cannot send it, send templet of holes and sample of screw by which to drill and countersink saw.

Diameter	Price	Diameter	Price
30 inches.	$32 00	46 inches.	$ 85 00
32 "	35 00	48 "	100 00
34 "	38 00	50 "	115 00
36 "	42 00	52 "	135 00
38 "	47 00	54 "	155 00
40 "	53 00	56 "	175 00
42 "	65 00	58 "	195 00
44 "	72 00	60 "	215 00

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BAND SAWS

JOINED



PRICES FOR BAND SAWS SET, SHARPENED AND JOINED COMPLETE

Inches Wide	Gauge	Price Per Foot	Inches Wide	Gauge	Price Per Foot
2	19	$0 65	8	14 to 16	$ 3 05
2½	19	85	9	14 to 16	3 45
3	19	1 05	10	14 to 16	3 85
3½	19	1 25	11	14 or 15	4 35
4	19	1 45	12	14 or 15	5 00
4½	18	1 65	13	14 or 15	6 00
5	18 or 19	1 85	14	13 or 14	7 00
5½	18 or 19	2 05	15	13 or 14	8 50
6	18 or 19	2 25	16	12 or 13	10 00
7	17	2 65			

NARROW  BAND SAWS

PLAIN BAND SAWS

DEC. 14, 1906

⅛-inch	Per foot,	$0	07
3/16 "	"		08
¼ "	"		09
⅜ "	"		10
½ "	"		11
⅝ "	"		13
¾ "	"		15

⅞-inch	Per foot,	$0	17
1 "	"		19
1⅛ "	"		21
1¼ "	"		23
1⅜ "	"		26
1½ "	"		29
1¾ "	"		32

Filing and setting 4 cents per foot extra.

Narrow Band Saws with beveled backs, advance list 50 per cent for first gauge and 10 per cent. for each additional gauge.

For Band Saws with Knife Edge, add 10 cents per foot to list.

BRAZING

¼ to ½-inch	$0	40
⅝ to ⅞ "		50
1 to 1¼ "		60
1⅜ to 1½ "		80
1¾ "		90
2 "	1	00
2½ "	1	25

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ATKINS CROSS-CUT SAWS

REX PERFORATED PATTERN SEGMENT GROUND, GAUGE 14x16, SPECIAL STEEL



Rex Perforated and Regular Patterns	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.	6½ ft.	7 ft.	7½ ft.	8 ft.
Price, without handles	$2 80	3 30	3 85	4 45	5 10	5 70	6 40	7 10	7 80
Price, with handles	3 10	3 60	4 10	4 80	5 60	6 40	7 30	8 30	9 30

ATKINS TUTTLE TOOTH, SPECIAL STEEL DIAMOND POINT CROSS-CUT SAW



	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.	6½ ft.	7 ft.	7½ ft.	8 ft.
Regular gauge, 14x16 gauge, without handles	$1 84	2 08	2 30	2 54	2 76	3 00	3 22	3 46	3 68

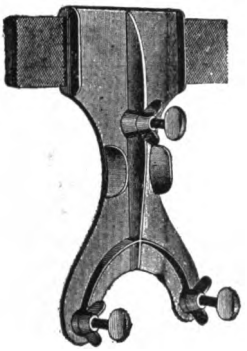
NOTE.—We can furnish the above saw in Silver-Steel. "Regular Gauge" is 14x16 gauge. "Thin-Back" is 14x18 gauge.

CEDAR KING ONE-MAN CROSS-CUT SAW



3ft.	3½ ft.	4 ft.	4½ t.
$2 40	2 80	3 20	3 60
5 ft.	**5½ ft.**	**6 ft.**	
$4 00	4 40	4 80	

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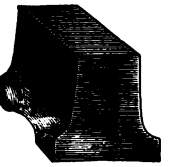
IMPROVED SIDE FILE

No. 1. Or large size, suitable for saws 40 inches diameter and larger.
No. 2. Medium size, suitable for saws 38 to 24 inches diameter.
No. 3. Small size, suitable for saws 24 inches diameter and smaller.

The Side File is used for the purpose of regulating saw teeth after they have been set. It is impossible to set a saw so that some of the teeth will not extend or be bent over a little more than others, and thus make rough lumber. By the use of this tool, all the teeth are made even, and a saw thus regulated will run twice as long without sharpening. The file must be so adjusted by means of the set-screw as to conform to any width of set desired. The jam-nuts are for the purpose of securing the set-screws in the desired position.

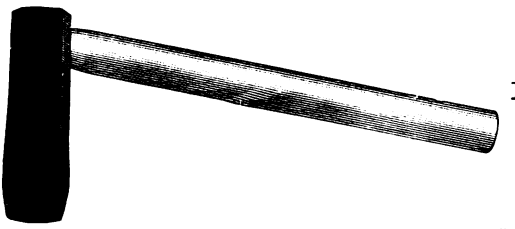
File for Side File.....Each, $0.40
Frame..... " 75
Complete..... " 1.15

STEEL FACED ANVILS



Weighing less than 180 lbs. - - Price per lb. $0.12
" over 180 lbs. - - - " " .13½

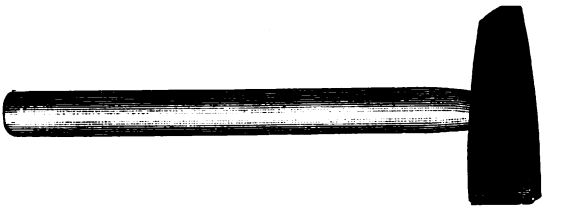
ROUND FACE HAMMER



Price per lb. - - - $0.40
Any weight furnished.

SQUARE FACE HAMMER

Price per lb. - - $0.40
Any weight furnished.





STRAIGHT EDGE

Inches	4	6	8	10	12	14	16	18	20	24	28	30
Price each,	$0.40	0.45	0.50	0.55	0.65	0.75	0.87	0.95	1.05	1.36	1.56	1.65

36	40	44	48	52	54	56	60	66	72	84	96	108	120
$1.95	2.10	2.30	3.00	3.50	3.70	4.00	4.60	5.00	5.50	6.50	7.50	3.50	9.50

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ATKINS SWAGES



ATKINS UPSET SWAGES

No. 0, for large Circular Saws.....$3 00
No. 1, for large Circular Saws..... 2 75
No. 2, for small Circular and Mill Saws..... 2 25
No. 3, for small Circular Saws..... 1 75



ATKINS BAND AND CYLINDER SAW SWAGE

No. 2 Swage, for Band and Cylinder Saws.....$2 25

MIXTER'S DUPLEX SWAGES



MIXTER'S PATENT SWAGES

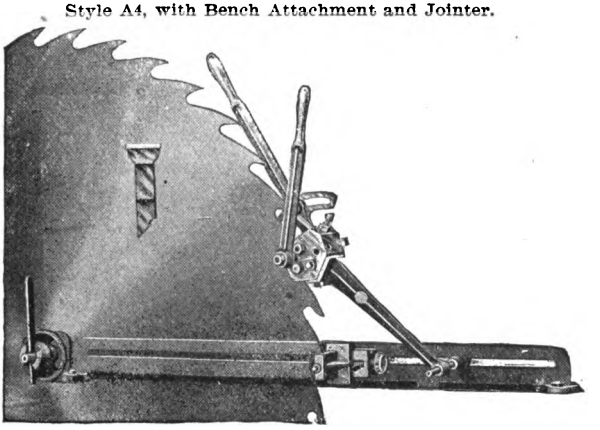
No. 3 Duplex Swage, largest size, for saws of from 5 to 10 gauge.....$7 00
No. 2 Duplex Swage, medium size, for saws of from 8 to 12 gauge..... 6 00
No. 1 Duplex Swage, for all thinner gauges..... 5 00
No. 0 Duplex Swage, for small, thin saws..... 4 00

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HANCHETT ADJUSTABLE SAW SWAGES.

FOR LARGE AND SMALL CIRCULAR, BAND, BAND RESAW AND GANG SAWS.

Style A4, with Bench Attachment and Jointer.



This style is composed of Hanchett's swage, bench attachment and jointer. It is designated as style A4. It differs from style A1 in that it has connected to the bench attachment, the jointer. The jointing is done by a piece of the ordinary mill file held firmly in place by a set screw and adjusted by a hand wheel. It is a simple machine practically impossible to get out of order, and is just what every filer wants to use every day.

PRICES, STYLE A1.

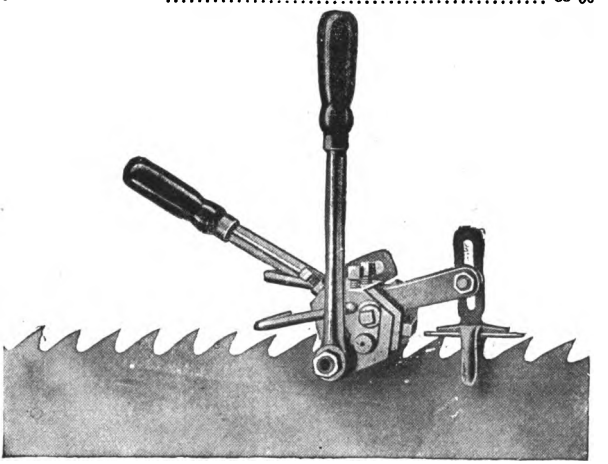
Size	No.	1,	for	Saws	5	to	10	gauge	inclusive	$38 00
"	"	0	"	"	8	"	12	"	"	38 00
"	"	2	"	"	11	"	16	"	"	35 00
"	"	3	"	"	16	"	18	"	"	30 00
"	"	4	"	"	19	"	26	"	"	30 00

PRICES, STYLE A4.

Size	No.	1,	for	Saws	5	to	10	gauge	inclusive	$42 00
"	"	0	"	"	8	"	12	"	"	42 00
"	"	2	"	"	11	"	16	"	"	38 00
"	"	3	"	"	16	"	18	"	"	35 00
"	"	4	"	"	18	"	26	"	"	35 00

HANCHETT BAND SAW SWAGE.

This style is designed especially for use on band, band resaw and gang saws. When used on gang saws a fork is furnished that has no foreward projection, thus making it more convenient for swaging the last teeth at lower end of saw. This swage is the most rapid to operate of any swage on the market.



Size No. 0, for use on saws 8 to 13 gauge $35 00
" " 1 " " " " 12 " 16 " 33 00

Size No. 2, for use on saws 16 to 18 gauge $28 00
" " 3 " " " " 18 " 26 " 28 00

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MACHINE KNIVES



PRICE LIST OF PLANING AND BARKING MACHINE KNIVES

Also Wood Chipper Knives, Flat Fur Cutting Bed Knives, and other ordinary Straight Knives of same finish (not otherwise provided for), 3/8 of an inch thick or less.

Price Per Inch	6¼ to 31 long	Over 31 to 40	Over 40 to 50	Over 50 to 60	Over 60 to 70	Over 70 to 80	Over 80 to 90	Over 90 to 100
		14	16	19	22	26	31	35
4 in. wide or less ..	12	Figure at actual measurement, viz.: 24⅛, 50⅛, &c. Knives wider or thicker in one part than another, figure by widest and thickest measurement. Measure by longest length, whether cutting edge or back.						
Over 4 to 4½ in.	15							
" 4½ to 5 "	18							
" 5 to 5½ "	21							
" 5½ to 6 "	24							
" 6 to 6½ "	27							
" 6½ to 7 "	30							
" 7 to 7½ "	33							
" 7½ to 8 "	35							
" 8 to 8½ "	39							
" 8½ to 9 "	44							
" 9 to 9½ "	49							
" 9½ to 10 "	53							
" 10 to 10½ "	58							
" 10½ to 11 "	63							
" 11 to 11½ "	67							
" 11½ to 12 "	71							

All knives longer or wider than in this list (unless otherwise provided for) figure by Special List. Advance for extra thickness all knives as follows:

Over 3/8 to 7/16 thick 10 per cent. Over 3/4 to 7/8 thick 30 per cent.
" 7/16 to 1/2 " 15 " " 7/8 to 1 " 35 "
" 1/2 to 5/8 " 20 " " 1 to 1¼ " 50 "
" 5/8 to 3/4 " 25 " " 1¼ to 1½ " 75 "
Over 1½ to 2 thick 100 per cent.

Knives with Counterbored Slots add 10 per cent.

STRAIGHT KNIVES, 6⅛ INCHES LONG OR LESS

(3/8 thick or less)

2 inches long or less, 4 inches wide or less.....50 cents each.
Over 2 to 4 inches long, 4 " " 62 "
" 4 to 6⅛ " " 4 " " 75 "

If over 4 inches wide, increase ¼ for each inch or fractional part.

Add 50 per cent for knives plated all over one face.

Advance for extra thickness. Counterbored slots add 10 per cent.

All Flat Knives (3/8 thick or less) with irregular edges (not moulding knives) add 50 per cent to list of straight knives 6⅛ inches long or less (except in lots of 50 or more without slots, as provided in Jointer and Sectional Matcher Bit List) and to list of Planer Knives, if over 6⅛ inches long. (This covers all knives with slightly convex, concave, angular, or irregular edges that can be ground on grindstone.) Figure by widest part of knife.

MOULDING CUTTER BLANKS

(Not tempered) 3/8 thick or less, 5 inches wide or less.

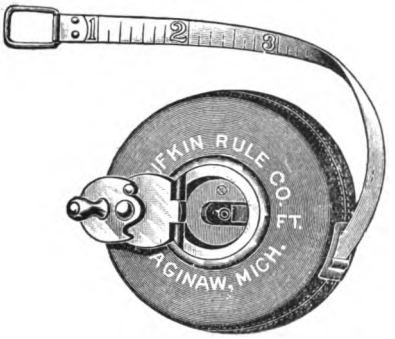
2 inches long or less	each,	$0 25
Over 2 to 3 inches long	"	35
" 3 to 4 " "	"	50
" 4 to 5 " "	"	60
" 5 to 6 " "	"	70

Advance 20 per cent over 5 inches wide.
Advance for extra thickness.

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MEASURING TAPES

"RELIABLE" STEEL MEASURING TAPES



With double folding flush handle, opened by pressing small pin or button on opposite side. Hard leather cases. Nickel plated trimmings. Measurements guaranteed perfectly accurate.

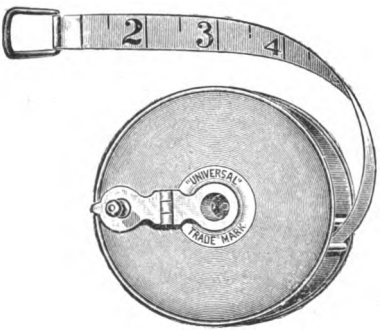
WITH 3-8 INCH TAPES

Marked feet and 12ths (ins. and eighths.)	Marked feet, 10ths and 100ths of feet, for Surveyor's use.	Length.	Diameter of case.	Each.
No. 200	No. 200 D	25 ft.	2¾ in.	$ 4 50
" 201	" 201 D	33 "	2¾ "	5 20
" 203	" 203 D	50 "	3¼ "	7 20
" 204	" 204 D	66 "	3¾ "	9 20
" 205	" 205 D	75 "	4¼ "	10 40
" 206	" 206 D	100 "	4½ "	12 80

The above tapes are marked on back with links and poles. When links are not wanted they will be supplied marked at every foot instead, at same price.
Packed one in a box.

"UNIVERSAL" MEASURING TAPES

EXTRA GRADE ASS SKIN



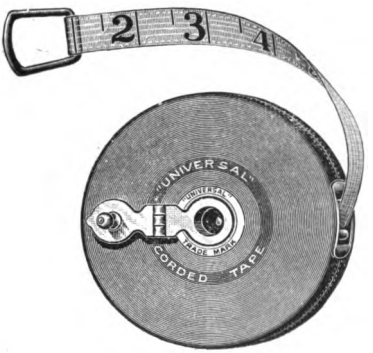
WITH 1-2 INCH LINEN CORDED TAPE

Cases brass bound and sides handsomely enameled. Brass folding handles, brass rings, clips and trimmings.

No.	730	731	733	734	735	736
Length, ft.	25	33	50	66	75	100
Price per doz.	$5 00	5 50	8 00	9 00	10 00	12 50

Packed one-half dozen in a box.

BEND LEATHER CASE



WITH 5-8 INCH LINEN CORDED TAPE

Cases russet leather, nicely finished in natural color. Brass folding handles and trimmings.

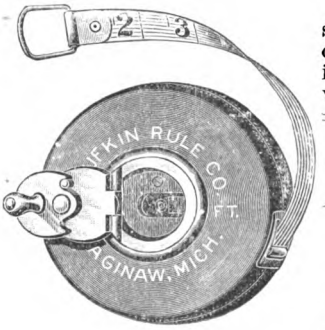
No.	940	941	943	944	945	946
Length, ft.	25	33	50	66	75	100
Price per doz.	$12 00	13 00	16 00	17 00	18 00	20 00

Packed one-half dozen in a box.

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METALLIC MEASURING TAPES

FLUSH HANDLE

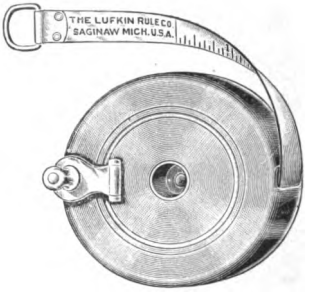


With our patent double folding flush handle, same as we use on our "Reliable" Steel Tapes, opened by pressing pin on opposite side. Tape 5/8 inch wide, made of best woven linen, with metallic warp. Hard leather cases.

Length	Marked one side only, 12ths	Price per dozen	Marked both sides, 12ths and Links	Marked both sides, 10ths and Links	Price per dozen
25 ft.	No. 600	$24 00	No. 600 L	No. 600 DL	$25 20
33 "	" 601	27 60	" 601 L	" 601 DL	28 80
50 "	" 603	33 60	" 603 L	" 603 DL	34 80
66 "	" 604	37 20	" 604 L	" 604 DL	39 60
75 "	" 605	40 80	" 605 L	" 605 DL	43 20
100 "	" 606	50 40	" 606 L	" 606 DL	54 00

Packed one in a box.

ARTISAN" STEEL TAPES



Nickel plated cases, flush handle; 3/8 inch tape, graduated one side only in feet, inches and sixteenths.

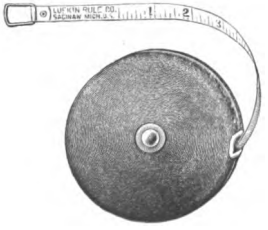
No. 108, 8 feet	Per doz.,	$15 00
" 112, 12 "	"	18 00
" 115, 15 "	"	21 00
" 120, 20 "	"	24 00

Packed one-half dozen in a box.

POCKET STEEL TAPES

IN LEATHER CASES

The cases for these tapes are made with metal lined leather of the very best quality and in attractive assorted colors. They are spring wind with center stop and all trimmings are silver plated. Each tape is put up in a handsome embossed paper box, with jeweler's cotton.

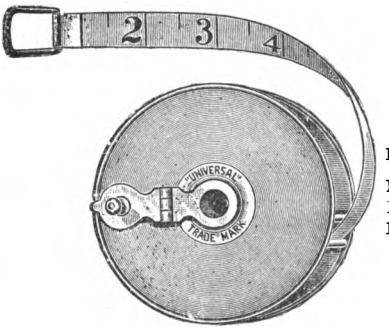


WITH 1-4 INCH STEEL TAPES

	Per doz.
No. 125, 60 inches, marked inches and 1-16ths	$18 0
" 125 M, 60 inches, 1½ meter, inches and 1-16ths on one side, millimeters on other	20 00
" 125 D, 60 inches, marked inches and 1-16ths on one side, feet, 10ths and 100ths of feet other side	20 00

Packed one-half dozen in a box.

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MEASURING TAPES.
CONTINUED.

ASS SKIN MEASURING TAPES.

With ½-inch Cotton Tape.

Brass bound cases, brass folding handles and trimmings.

No.	710	711	712	713	714	715	716
Length, ft.,	25	33	40	50	66	75	100
Per doz.,	$3 75	$4 00	$4 50	$5 00	$6 00	$7 50	$9 00

METALLIC MEASURING TAPES.

FOLDING HANDLE.



Tape ⅝ inch wide, made of best woven linen with metallic warp. Hard leather cases, brass folding handles and brass trimmings.

Length.	Marked one side only. 12ths.	Price per dozen	Marked both sides. 12ths & Links.	Marked both sides. 10ths & Links.	Price per doz.
25 ft.	No. 500	$20 40	No. 500 L	No. 500 DL	$21 60
33 "	" 501	24 00	" 501 L	" 501 DL	25 20
40 "	" 502	26 40	" 502 L	" 502 DL	27 60
50 "	" 503	30 00	" 503 L	" 503 DL	31 20
66 "	" 504	33 60	" 504 L	" 504 DL	36 00
75 "	" 505	37 20	" 505 L	" 505 DL	39 60
100 "	" 506	46 80	" 506 L	" 506 DL	50 40

Tapes marked in meters and centimeters on back instead of links, price same as tapes marked both sides.

Tapes marked in feet on back instead of links, price same as tapes marked both sides.

Marked in Meters and Centimeters, one side only.

No.	501 M	503 M	504 M	505½ M	506 M
Length, meters,	10	15	20	25	30
Price, per dozen,	$24 00	$30 00	$33 60	$40 80	$46 80

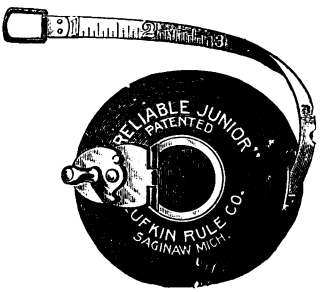
METALLIC TAPES ONLY, WITHOUT CASES.

Length, feet,	25	33	40	50	66	75	100
Marked one side, per doz.,	$9 60	$12 00	$14 40	$16 80	$19 20	$21 60	$31 20
" both sides, "	10 80	13 20	15 60	18 00	21 60	24 00	34 80
Length, meters,	10	15	20		25	30	
Marked one side, per doz.,	$12 00	$16 80	$19 20		$25 00	$31 20	

"RELIABLE JUNIOR" STEEL MEASURING TAPES.

With double folding flush handle, opened by pressing small pin or button, on opposite side. Hard leather cases. Nickel plated trimmings. Measurements guaranteed perfectly accurate

WITH ¼-INCH TAPES.



Marked feet and 12ths (inches and sixteenths.)	Marked feet 10ths and 100ths of feet, for Surveyors' use.	Length.	Diameter of Case.	Per Dozen.
No. 100	No. 100 D	25 feet.	2¼ inches	$45 00
" 101	" 101 D	33 "	2½ "	48 00
" 103	" 103 D	50 "	2¾ "	55 00
" 104	" 104 D	66 "	3 "	63 00

Tapes marked metric measure, one side only, at same price.

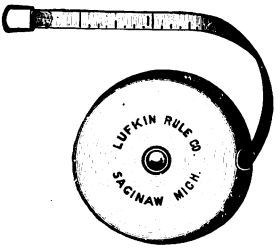
Tapes marked feet one side, metric measure on the other add 2 cents per foot to list price.

Tapes marked feet and 12ths one side, feet and 10ths on the other, add 2 cts. per foot to list price.

A convenient Vest Pocket Steel Tape; 25 ft. weighs only 3 ounces; 50 ft. only 5 ounces complete and the other sizes in proportion.

"Reliable Jr." Tapes only, without cases 25 ft., per doz. $27.00; 33 ft., per doz. $34.00; 50 ft., per doz. $36.00; 66 ft., per doz. $42.00

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MEASURING TAPES—CONTINUED.

POCKET LINEN TAPES.

With handsome and durable round edge nickel plated brass cases, spring wind, center stop.

With ¼-inch Enameled Linen Tape.

No. 173.	36 inches, marked inches and 8ths.	Per dozen	$3 50
No. 175.	60 " " " " " "	"	4 50
No. 176.	72 " " " " " "	"	5 00
No. 173M.	36 " 1 meter, in. and 8ths and millimeters.	Per doz.	4 50
No. 175M.	60 " 1½ " " " " " "	"	6 00
No. 176M.	72 " 2 " " " " " "	"	7 00

With 5-16-inch Enameled Linen Tape.

No. 188.	96 inches, marked inches and 8ths.	Per dozen	$3 50
No. 188F.	8 feet, marked feet, " " " " "	"	8 50

POCKET STEEL TAPES.

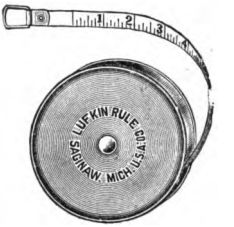
Nickel Plated Brass Cases, Spring Wind, with Center Stop.

Marked one side only.

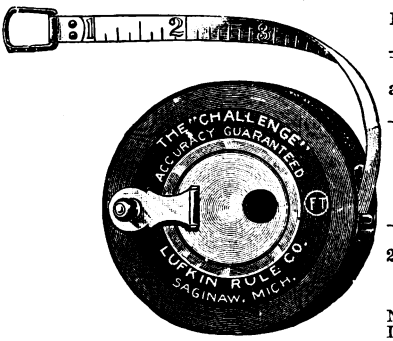
No. 143.	36 inches, ¼-inch Tape, marked inches and 16ths.	Per doz	$ 7 00
No. 145.	60 " ¼ " " " " " " "	"	9 00
No. 146.	72 " ¼ " " " " " " "	"	10 00
No. 148.	96 " ¼ " " " " " " "	"	14 00
No. 148F.	8 feet, ¼-inch Tape, marked feet, inches and 16ths.	"	14 00

With Metric Measure. Inches and 16ths One Side, Millimeters Other Side.

No. 143M.	36 inches, 1 meter, ¼-inch Tape.	Per doz	$ 8 00
No. 145M.	60 " 1½ " ¼ " " " "	"	10 00
No. 146M.	72 " 2 " ¼ " " " "	"	12 00
No. 148M.	96 " 2½ " ¼ " " " "	"	16 00



"CHALLENGE" STEEL MEASURING TAPES.



Hard leather cases, nickel plated trimmings, flush handle, ⅜-inch tape marked one side only, in 10ths or 12ths.

Marked Feet and 12ths (Ins. and 8ths).	Marked Feet. 10ths and 100ths of Ft., for Surveyors' use	Leng'h	Diam. of Case.	Dozen.
No. 260	No. 260 D	25 ft.	2¼ in.	$39 00
" 261	" 261 D	33 "	2¾ "	42 00
" 263	" 263 D	50 "	3¼ "	48 00
" 264	" 264 D	66 "	3¾ "	60 00
" 265	" 265 D	75 "	4¼ "	63 00
" 266	" 266 D	100 "	4½ "	81 00

Marked inches one side, metric measure other side, add 2 cents per foot to list price.

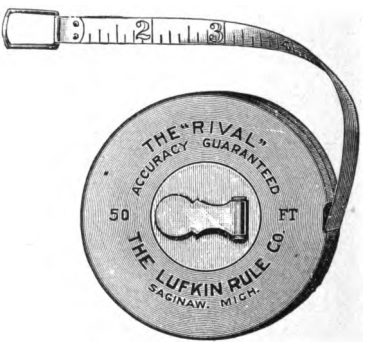
Marked in Meters and Centimeters.
One Side Only. Millimeters the first 10 Centimeters.

No.	261M	263M	264M	265½M	266M
Length, meters,	10	15	20	25	30
Price, per dozen,	$42 00	$48 00	$60 00	$72 00	$81 00

Packed one-half dozen in a box.

"RIVAL" STEEL MEASURING TAPES.

Nickel plated steel cases, flush handle, ⅜-inch tapes, marked one side only in 10ths or 12ths.



Marked Feet and 12ths (Ins. and 8ths).	Marked Feet. 10ths and 100ths of Ft., for Surveyor's use	Leng'h	Diam. of Case.	Dozen.
No. 240	No. 240 D	25 ft.	2¼ in.	$33 00
" 241	" 241 D	33 "	2¾ "	36 00
" 243	" 243 D	50 "	3¼ "	40 80
" 244	" 244 D	66 "	3¾ "	51 00
" 245	" 245 D	75 "	3¾ "	54 00
" 246	" 246 D	100 "	4¼ "	69 00

Marked inches one side, metric measure other side, add 2 cents per foot to list price.

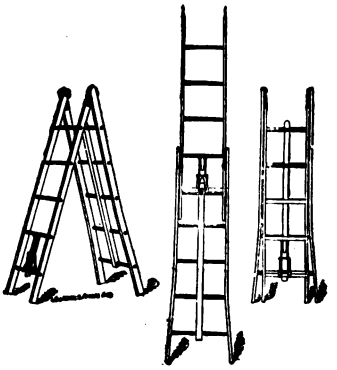
Marked in Meters and Centimeters.
One Side Only. Millimeters the first 10 Centimeters.

No.	241M	243M	244M	245½M	246M
Length, meters	10	15	20	25	30
Price, per dozen,	$36 00	$40 80	$51 00	$61 20	$69 00

Packed one-half dozen in a box.

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THE ONLY CENTER-RAIL COMBINED
STEP AND EXTENSION LADDER



Can be extended any number of steps at a time to twice its length. Can be telescoped to one-half its length.

Every ladder comes apart, giving two distinct ladders.

Made of Norway pine, hardwood rounds, malleable castings and pressed steel.

From 12 to 24 ft. step and extension; 26 to 40 feet extension only, unless otherwise ordered.

Prices on application.

Closed

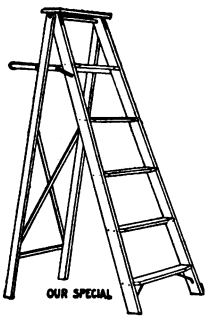


Extended

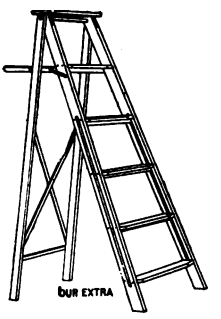


STEP LADDERS

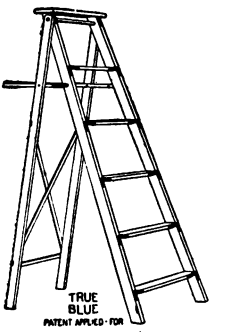
Special



Extra



True Blue



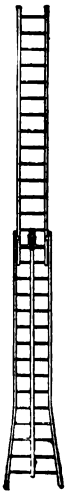
We are prepared to furnish any of the above types of Step Ladders in lengths of 4, 5, 6, 7 and 8 feet. Prices on application.

Send for special ladder catalogue.

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COMMON EXTENSION LADDERS

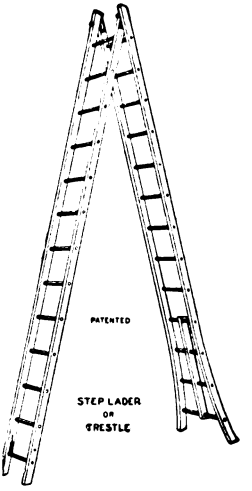
Extended



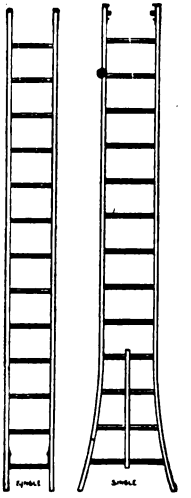
Closed



Step Ladder or Trestle



Single

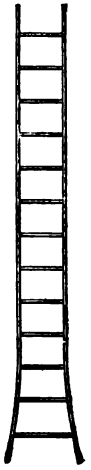


Combined Step and Trestle up to and including 24 feet. Longer lengths extensions only, unless otherwise ordered.

Ladders are same as Center-Rail Ladders shown on preceding page, spread at the base in proportion to length.

Made of Norway pine, selected hardwood rounds, malleable castings and pressed steel. Lengths 12 to 40 feet.

Price, all lengths.....$....



SINGLE LADDERS

The most perfect single ladder made. Material, Norway pine, selected hardwood rounds, every round "shouldered," driven clear through and nailed. Full width at top, and spread at base in proportion to length.

On account of wide spread at base, the 18 and 20-ft. lengths have a short center-rail to prevent the rounds bending.

Workmanship unsurpassed.

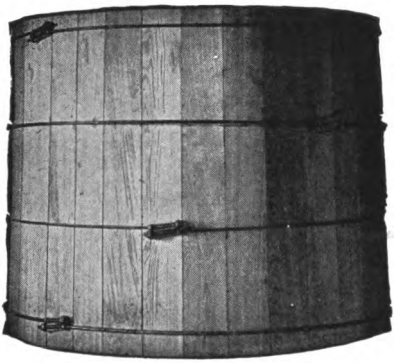
Light but strong.

Price.....$....

Send for special ladder catalogue.

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ROUND TANKS



CYPRESS is superior to any other wood for tank purposes. It does not warp or check, and is not affected by exposure. Next to cypress we would recommend Michigan white pine. These two woods are used in our highest grade tanks.

For those who require a good, yet low priced tank, we offer our Long Leaf Yellow Pine and Michigan Tamarack Tanks.

The price list below only covers a few of the standard and most popular sizes. Can furnish promptly smaller or larger sizes to meet any specifications.

PRICE LIST

Length of Stave, ft.	Diameter of Bottom, ft.	Number of Hoops	Weight 2" Pine Lumber	Capacity in Gallons	List Price
5	5	4	550	595	$ 26 60
5	6	4	575	880	32 95
5	7	4	650	1,165	38 00
6	6	4	655	1,089	37 20
6	7	4	800	1,449	45 80
6	8	4	950	1,969	53 40
7	7	6	810	1,698	52 00
7	8	6	1,036	2,579	63 00
7	9	6	1,114	2,904	66 75
8	8	6	1,060	2,648	64 30
8	9	6	1,228	3,346	72 25
8	10	6	1,404	4,200	84 50
9	9	8	1,340	3,787	81 15
9	10	8	1,530	4,712	90 00
9	11	8	1,728	5,737	102 00
10	10	8	1,656	5,206	103 45
10	11	9	1,866	6,461	116 45
10	12	9	2,084	7,718	130 65
11	11	10	2,004	7,074	132 15
11	12	10	2,235	8,463	145 40
11	14	10	2,719	11,613	176 90

Write for special tank catalogue and prices.

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RULES FOR DETERMINING SIZE AND SPEED OF PULLEYS, GEARS OR SPROCKET WHEELS

The driving Pulley is called the Driver, and the driven Pulley the Driven.

If the number of *teeth in gears or sprocket wheels* are used instead of diameter in these calculations, number of teeth must be substituted whenever diameter occurs.

To determine the Diameter of Driver, the diameter of the Driven and its revolutions, and also revolutions of driver being given.

$$\frac{\text{Diam. of Driven} \times \text{revolutions of Driven}}{\text{Revolutions of Driver.}} = \text{Diam. of Driver.}$$

To determine the diameter of Driven, the revolutinns of the Driven and diameter and revolutions of the Driver being given.

$$\frac{\text{Diam. of Driver} \times \text{revolutions of Driver}}{\text{Revolutions of Driven.}} = \text{Diam. of Driven.}$$

To determine the revolutions of the Driver, the diameter and revolutions of the Driven, and diameter of the Driver being given.

$$\frac{\text{Diam. of Driven} \times \text{revolutions of Driven}}{\text{Diameter of Driver.}} = \text{Rev. of Driver.}$$

To determine the revolutions of the Driven, the diameter and revolutions of the Driver, and diameter of the Driven being given.

$$\frac{\text{Diam. of Driver} \times \text{revolutions of Driver}}{\text{Diameter of Driven.}} = \text{Rev. of Driver.}$$

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HORSE POWER OF BELTING

A simple rule for ascertaining transmitting power of belting, without first computing speed per minute that it travels, is as follows: Multiply diameter of pulley in inches by its number of revolutions per minute, and this product by width of the belt in inches; divide this product by 3,300 for single belting, or by 2,100 for double belting, and the quotient will be the amount of horse power that can be safely transmitted.

TABLE FOR SINGLE LEATHER, FOUR-PLY RUBBER AND FOUR-PLY COTTON BELTING, BELTS NOT OVERLOADED

1 inch wide, 800 feet per minute=1 horse power.

Speed in Feet Per Minute.	WIDTH OF BELTS IN INCHES.											
	2	3	4	5	6	8	10	12	14	16	18	20
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
400	1	1½	2	2½	3	4	5	6	7	8	9	10
600	1½	2¼	3	3¾	4½	6	7½	9	10½	12	13½	15
800	2½	3	4	5	6	8	10	12	14	16	18	20
1000	2	3¾	5	6¼	7½	10	12½	15	17½	20	22½	25
1200	3	4½	6	7½	9	12	15	18	21	24	27	30
1500	3¾	5¼	7½	9½	11½	15	18¾	22½	26½	30	33¾	37½
1800	4½	6¾	9	11¼	13½	18	22½	27	31½	36	40½	45
2000	5	7½	10	12½	15	20	25	30	35	40	45	50
2400	6	9	12	15	18	24	30	36	42	48	54	60
2800	7	10½	14	17½	21	28	35	42	49	56	63	70
3000	7½	11¼	15	18¾	22½	30	37½	45	52½	60	67½	75
3500	8¾	13	17½	22	26	35	44	52½	61	70	79	88
4000	10	15	20	25	30	40	50	60	70	80	90	100
4500	11¼	17	22½	28	34	45	57	69	78	90	102	114
5000	12½	19	25	31	37½	50	62½	75	87½	100	112	125

Double leather, six-ply rubber or six-ply cotton belting will transmit 50 to 75 per cent. more power than is shown in this table. (One inch wide, 550 feet per minute=one horse power.)

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USEFUL INFORMATION

To find diameter of a circle multiply circumference by .31831.

To find circumference of a circle multiply diameter by 3.1416.

To find area of a circle multiply square of diameter by .7854.

To find surface of a ball multiply square of diameter by 3.1416.

To find side of an equal square multiply diameter by .8862.

To find cubic inches in a ball multiply cube of diameter by .5236.

Doubling the diameter of a pipe increases its capacity four times

Double riveting is from 16 to 20 per cent stronger than single.

One cubic foot of anthracite coal weighs about 53 pounds.

One cubic foot of bituminous coal weighs from 47 to 50 pounds.

One ton of coal is equivalent to two cords of wood for steam purposes.

A gallon of water (U. S. standard) weighs 8⅓ pounds and contains 231 cubic inches.

A cubic foot of water contains 7½ gallons, 1728 cubic inches, and weighs 62½ pounds.

To sharpen dull files lay them in dilute sulphuric acid until they are eaten deep enough.

A horse-power is equivalent to raising 33,000 pounds 1 foot per minute or 550 pounds 1 foot per second.

To find the pressure in pounds per square inch of a column of water multiply the height of the column in feet by .434.

Steam rising from water at its boiling point (212 degrees) has a pressure equal to the atmosphere (14.7 pounds to the square inch).

To evaporate 1 cubic foot of water requires the consumption of 7½ pounds of ordinary coal or about 1 pound of coal to 1 gallon of water.

One-sixth of tensile strength of plate multiplied by thickness of plate and divided by one-half the diameter of boiler gives safe working pressure for tubular boilers. For marine boilers add 20 per cent for drilled holes.

No plate or bars of either steel or iron should be worked at a *black or blue heat* (say about 500 degrees); the material will stand far more strain *either red hot or cold*, while at an intermediate point great risks will be run, and possibly strains produced which result in rupture later on.

A "miner's inch" of water is approximately equal to a supply of 12 U. S. gallons per minute.

The mean pressure of the atmosphere is estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of water 33.9 feet high.

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USEFUL INFORMATION—CONTINUED

A cubic inch of water evaporated under atmospheric pressure is approximately converted into 1 cubic foot of steam.

The horse-power of boilers, as per standard adopted by the Am. S. M. E. is 30 pounds water evaporated per hour at a pressure of 70 pounds per square inch and from a temperature of 100 degrees Fahrenheit.

Well-designed boilers, under successful operation, will evaporate from 7 to 10 pounds of water per pound of first-class coal.

Each square foot of heating surface is considered sufficient to evaporate 2 pounds of water; therefore, for an engine using 30 pounds water per horse-power per hour, each horse-hower of the engine requires 15 square feet heating surface in the boiler.

On one square foot of fire grate can be burned on an average from 10 to 12 pounds hard coal, or 18 to 20 pounds soft coal, per hour, with natural draft.

Two and one-quarter pounds of dry wood is equal to 1 pound of average quality soft coal.

There is a saving of about 1 per cent in fuel burned for every 11 degrees that feed water is warmed. With sufficient exhaust steam available, if cold water at 70 degrees is raised to 210 degrees Fahrenheit, the saving of fuel will approximate 12 per cent.

Designers of steam piping figure on a steam travel of about a mile and a half per minute. Very often it is much more than this.

The friction of water in pipes is as the square of velocity.

The capacity of pipes is as the square of their diameters; thus, doubling the diameter of a pipe increases its capacity four times.

The height of a column of fresh water, equal to a pressure of 1 pound per square inch, is 2.31 feet. (In usual computation this is taken at 2 feet, thus allowing for ordinary friction.)

To find the capacity of a cylinder, in gallons: multiplying the area in inches by the length of stroke in inches will give the total amount of cubic inches; divide this amount by 231 (the cubical contents of a U. S. gallon in inches) and the product is the capacity in gallons.

WEIGHT AND SIZE OF DIFFERENT STANDARD GALLONS OF WATER

	Cubic Inches in a Gallon.	Weight of a Gallon in Pounds.	Gallons in a Cubic Foot.	Weight of a Cubic Foot of Water
Imperial, or English..	277.274	10.00	6.232102	English Standard, 62.321 pounds, Avoirdupois.
United States	231	8.33111	7.480519	

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USEFUL INFORMATION—CONTINUED

STEAM

To Calculate Horse-Power of an Engine.—The most convenient method is to multiply the area of the piston (see Area of Circles), in square inches by the speed (length of stroke by number of strokes) of the piston, in feet per minute, and divide the product by 33,000. The result is the horse-power value of one pound of mean effective pressure, which, if multiplied by the whole mean effective pressure, will give the indicated horse-power. The net effective horse-power is the indicated H. P. less the friction of the engine.

Example.—Suppose we have an engine 18" x 36", running 100 revolutions (200 strokes), boiler pressure 100 lbs., cutting off at ¼ stroke—

Area 18" (see table), 254.46.

Stroke 36" (3 feet) × 200=600 feet.

Area, 254.46 × 600 = 152,676 ÷ 33,000 =4.62 I. H. P. (the value of one pound mean effective pressure. I. H. P., 4.62 × 59.657 (see table, page 758) =275.6 H. P. of the engine. Or to put the above into a simple formula—

$$\text{H. P.} = \frac{A \times P \times V}{33{,}000}$$

in which

A = Area of piston in square inches.

P = Mean pressure of steam on piston per square inch.

V = Velocity of piston per minute in feet.

Ordinary slide valve engines require 33 to 45 pounds of steam per indicated horse-power per hour; automatic engines 30 to 36 pounds; simple Corliss 24 to 30 pounds. By compounding, and running condensing, a limit of 12 pounds is reached in the very best engine construction.

In round numbers, twenty-five times as much water is required to condense the exhaust steam from an engine as was evaporated in the boilers to form it. The actual quantity will vary, being the lowest in the winter months and highest in the summer months, if obtained from a running stream; if the supply is had from a well, the quantity will remain more nearly constant. A very convenient factor is to allow 1½ gallons per horse-power per minute for high grade automatic engines, and from 2 to 2½ gallons per horse-power per minute for ordinary slide-valve or single-valve engines.

Surface condensers for compound steam engines require about 2 square feet of cooling surface per horse-power; ordinary engines will require more surface according to their economy in the use of steam. It is absolutely necessary that the air-pump should be set lower than the condenser for satisfactory results.

The effect of a good air-pump and condenser should be to get 25 inches of vacuum and to make availvable about 10 lbs. more mean effective pressure with the same terminal pressure, or to give the same mean effective pressure with a correspondingly less terminal pressure. Approximately, a good condenser will save one-fourth of the fuel consumed, or, in other words, increase the power of the engine one-fourth, the fuel consumption remaining the same.

ELECTRICAL

1 H. P. equals ¾ Kilowatt. 1 Kilowatt is equivalent of 16 candle power incandescent lamps. 1 H. P. equals ten 16 c. p. incandescent lamps.

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USEFUL INFORMATION—CONTINUED

MENSURATION

PROPERTIES OF THE CIRCLE

Diameter x 3.14159=circumference.
Diameter x .8862 =side of an equal square.
Diameter x .7071 =side of an inscribed square.
Diameter^2 x .7854 =area of a circle.
Radius x 6.28318=circumference.
Circumference ÷ 3.14159 = diameter

AREAS OF CIRCLES, ADVANCING BY EIGHTHS

Diam.	AREAS.								Diam.
	0	⅛	¼	⅜	½	⅝	¾	⅞	
0	0	.0122	.0491	.1104	.1963	.3068	.4418	.6013	0
1	.7854	9940	1.227	1.485	1.767	2.074	2.405	2.761	1
2	3.141	3.546	3.976	4.430	4.908	5.412	5.939	6.492	2
3	7.068	7.669	8.295	8.946	9.621	10.32	11.04	11.79	3
4	12.56	13.36	14.18	15 03	15.90	16 80	17.72	18.66	4
5	19 63	20.62	21.64	22.69	23.75	24.85	25.96	27.10	5
6	28.27	29.46	30.67	31.91	33.18	34.47	35.78	37.12	6
7	38.48	39.87	41.28	42.71	44.17	45.66	47.17	48.70	7
8	50.26	51.84	53.45	55.08	56.74	58.42	60.13	61.86	8
9	63.61	65.39	67.20	69 02	70.88	72.75	74.66	76.58	9
10	78.54	80.51	82.51	84.54	86 59	88.66	90.76	92.88	10
11	95.03	97.20	99.40	101.6	103.8	106.1	108.4	110.7	11
12	113.0	115.4	117.8	120.2	122.7	125.1	127.6	130.1	12
13	132.7	135.2	137.8	140.5	143.1	145.8	148.4	151.2	13
14	153.9	156.6	159.4	162.2	165.1	167.9	170.8	173.7	14
15	176.7	179.6	182.6	185.6	188.6	191.7	194,8	197.9	15
16	201.0	204.2	207.3	210.5	213.8	217.0	220.3	223.6	16
17	226.9	230.3	233.7	237.1	240.5	243.9	247.4	250.9	17
18	254.4	258.0	261.5	265.1	268.8	272.4	276.1	279.8	18
19	283.5	287.2	291.0	294.8	298.6	302.4	306.3	310.2	19
20	314.1	318.1	322.0	326 0	330.0	334.1	338.1	342.2	20
21	346.3	350.4	354.6	358.8	363.0	367.2	371.5	375.8	21
22	380.1	384.4	388.8	393.2	397.6	402.0	406.4	410.9	22
23	415.4	420.0	424.5	429.1	433.7	438.3	443.0	447.6	23
24	452.3	457.1	461.8	466.6	471.4	476.2	481.1	485.9	24
25	490.8	495 7	500.7	505.7	510.7	515.7	520.7	525.8	25
26	530.9	536.0	541.1	546.3	551.5	556.7	562.0	567.2	26
27	572.5	577.8	583.2	588.5	593.9	599.3	604.8	610.2	27
28	615.7	621.2	626.7	632.3	637.9	643.5	649.1	654.8	28
29	660.5	666.2	671.9	677.7	683.4	689.2	695.1	700.9	29
30	706.8	712.7	718.6	724.6	730.6	736.6	742.6	748.6	30
31	754.8	760.9	767.0	773.1	779.3	785.5	791.7	798.0	31
32	804.2	810.5	816.9	823.2	829.6	836.0	842.4	848.8	32
33	855.3	861.8	868.3	874.8	881.4	888.0	894.6	901.3	33
34	907.9	914.6	921.3	928.1	934.8	941.6	948.4	955.3	34
35	962.1	969.0	975.9	982.8	989.8	996.8	1003.8	1010.8	35
36	1017.9	1025.0	1032.1	1039.2	1046.4	1053.5	1060.7	1068.0	36
37	1075.2	1082.5	1089.8	1097.1	1104.5	1111.8	1119.2	1126.7	37
38	1134.1	1141.6	1149.1	1156.6	1164.2	1171.7	1179.3	1186.9	38
39	1194.6	1202.3	1210.0	1217.7	1225.4	1233.2	1241.0	1248.8	39
40	1256.6	1264.5	1272.4	1280.3	1288.3	1296.2	1304.2	1312.2	40
41	1320.3	1328.3	1336.4	1344.5	1352.7	1360.8	1369.0	1377.2	41
42	1385.4	1393.7	1402.0	1410.3	1418.6	1427.0	1435.4	1443.8	42
43	1452.2	1460.7	1469.1	1477.6	1486.2	1494.7	1503.3	1511.9	43
44	1520.5	1529.2	1537.9	1546.6	1555.3	1564.0	1572.8	1581.6	44
45	1590.4	1599.3	1608.2	1617.0	1626.0	1634.9	1643.9	1652.9	45
46	1661.9	1671.0	1680.0	1689.1	1698.2	1707.4	1716.5	1725.7	46
47	1734 9	1744.2	1753.5	1762.7	1772.1	1781.4	1790.8	1800.1	47
48	1809.6	1819.0	1828.5	1837.9	1847.5	1857.0	1866.6	1876.1	48
49	1885.7	1895.4	1905.0	1914.7	1924.4	1934.2	1943.9	1953.7	49
50	1963.5	1973.3	1983.2	1993.1	2003.0	2012.9	2022.8	2032.8	50

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USEFUL INFORMATION—CONTINUED

LOSS OF FRICTION BY WATER IN PIPES

This table shows the loss in pounds pressure per square inch for each 100 feet in length due to friction, when discharging the given quantities of water per minute.

Galls per Minute.	SIZE OF PIPES—INSIDE DIAMETER.														
	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.
5	3.3	.84	.31	.12											
10	13 0	3.16	1.05	.47	.12										
15	28.7	6.98	2.38	.97											
20	50.4	12.30	4.07	1.66	.42										
25	78.0	19 00	6.40	2.62		.21	.10								
30		27.50	9.15	3.75	.91										
35		37.00	12.40	5.05											
40		48.00	16.10	6.52	1.60										
45			20.20	8.15											
50			24.90	10.00	2.44	.81	.35	.09							
75			56 10	22.40	5.32	1.80	.74								
100				39.00	9.46	3.20	1.31	.33	.05						
125					14.90	4.89	1.99	..							
150					21.20	7.00	2.85	.69	.10						
175					28.10	9.46	3.85								
200					37.50	12.47	5.02	1.22	.17						
250						19.66	7.76	1.89	.26	.07	.03	.01			
300						28.06	11.20	2.66	.37	.09	.04				
350							15.20	3.65	.50	.12	.05	.02			
400							19.50	4.73	.65	.16	.06				
450							25.00	6.01	.81	.20	.07	.03			
500							30.80	7.43	.96	.25	.09	.04	.017	.009	.005
750									2.21	.53	.18	.08			
1000									3.38	.94	.32	.13	.062	.036	.020
1250										1.46	.49	.20			
1500										2.09	.70	.29	.135	.071	.040
1750											.95	.38			
2000											1.23	.49	.234	.123	.071
2250												.63			
2500												.77	.362	.188	.107
3000												1.11	.515	.267	.150
3500													.697	.365	.204
4000													.910	.472	.263
4500														.593	.333
5000														.730	.408

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USEFUL INFORMATION—CONTINUED

DATA ON AIR COMPRESSION

FRANK RICHARDS, M. E.

AIR COMPRESSION FROM ONE ATMOSPHERE, AT SEA LEVEL, 60° FAHRENHEIT.						HORSE-POWER (THEORETICAL).			
Gauge Pressure, lbs.	Volume.		Mean Pressure per Stroke.		Final temper.	To compress 1 cu. ft. free air per minute.		To deliver 1 cu. ft. compressed air per minute.	
	Air const. temper.	Air not cooled.	Air const. temper.	Air not cooled	Air not cooled.	Air const. temper.	Air not cooled.	Air const. temper.	Air not cooled.
0	1.000	1.000	.00	.00	60.0				
1	.936	.950	.96	.97	71.0				
2	.880	.910	1.87	1.91	80.4				
3	.830	.870	2.72	2.80	88.9				
4	.786	.840	3.53	3.67	98.0				
5	.746	.810	4.30	4.50	106.0	.0187	.0196	.0251	.0263
10	.595	.690	7.62	8.27	145.0	.0332	.0360	.0558	.0649
15	.495	.606	10.33	11.50	178.0	.0450	.0502	.0910	.0114
20	.423	.543	12.62	14.40	207.0	.0550	.0628	.1299	.1482
25	.370	.494	14.59	17.01	234.0	.0636	.0742	.1719	.2004
30	.328	.463	16.34	19.40	255.0	.0713	.0846	.2167	.2573
35	.295	.420	17.92	21.60	281.0	.0782	.0942	.2644	.3187
40	.268	.393	19.32	23.66	302.0	.0843	.1032	.3137	.3842
45	.246	.370	20.52	25.59	321.0	.0895	.1116	.3636	.4535
50	.227	.350	21.79	27.39	339 0	.0950	.1195	.4184	.5260
55	.210	.331	22.77	29.11	357.0	.0993	.1270	.4711	.6022
60	.196	.314	23.84	30.75	375.0	.1040	.1341	.5285	.6818
65	.184	.301	24.77	31.69	389.0	.1080	.1402	.5861	.7607
70	.173	.288	26.00	33.73	405.0	.1124	.1471	.6481	.8483
75	.163	.276	26.65	35.23	420.0	.1162	.1537	.7095	.9379
80	.155	.267	27.33	36.60	432.0	.1192	.1597	.7684	1.0290
85	.147	.256	28.05	37.94	447.0	.1224	.1655	.8303	1.1231
90	.140	.248	28.78	39.18	459.0	.1255	.1709	.8944	1.2176
95	.134	.240	29.53	40.40	472.0	.1288	.1762	.9616	1.3148
100	.128	.232	30.07	41.60	485.0	.1312	.1815	1.0243	1.4171

NOTE.—Losses by machine friction, heating the air, clearance, etc., reduce the efficiency to about 60 per cent for single stage and 75 per cent for two stage compression.

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USEFUL INFORMATION—CONTINUED

CONTENTS OF ROUND TANKS IN U. S. GALLONS FOR EACH FOOT IN DEPTH

Diameter. Ft.	In.	Gallons. 1 Foot in Depth.	Diameter. Ft.	In.	Gallons. 1 Foot in Depth.	Diameter. Ft.	In.	Gallons. 1 Foot in Depth.
1	0	5.8735	11	0	710.6977	21	0	2590.2290
1	3	9.1766	11	3	743.3686	21	3	2652.2532
1	6	13.2150	11	6	776.7746	21	6	2715.0413
1	9	17.9870	11	9	810.9143	21	9	2778.5486
2	0	23.4940	12	0	848.1890	22	0	2842.7910
2	3	29.7340	12	3	881.3966	22	3	2907.7664
2	6	36.7092	12	6	917.7395	22	6	2973.4889
2	9	44.4179	12	9	954.8159	22	9	3039.9209
3	0	52.8618	13	0	992.6274	23	0	3107.1001
3	3	62.0386	13	3	1031.1719	23	3	3175.0122
3	6	73.1504	13	6	1070.4514	23	6	3243.6595
3	9	82.5959	13	9	1108.0645	23	9	3313.0403
4	0	93.9754	14	0	1151.2129	24	0	3383.1563
4	3	103.0300	14	3	1192.6940	24	3	3454.0051
4	6	118.9386	14	6	1234.9104	24	6	3525.5929
4	9	132.5209	14	9	1277.8615	24	9	3597.9068
5	0	146.8384	15	0	1321.5454	25	0	3670.9596
5	3	161.8886	15	3	1365.9634	25	3	3744.7452
5	6	177.6740	15	6	1407.5165	25	6	3819.2657
5	9	194.1913	15	9	1457.0032	25	9	3894.5203
6	0	211.4472	16	0	1503.6250	26	0	3970.5098
6	3	229.4342	16	3	1550.9797	26	3	4047.2322
6	6	248.1564	16	6	1599.0696	26	6	4124.6898
6	9	267.6122	16	9	1647.8930	26	9	4202.9610
7	0	287.8032	17	0	1697.4516	27	0	4281.8072
7	3	308.7270	17	3	1747.7431	27	3	4361.4664
7	6	330.3859	17	6	1798.7698	27	6	4441.8607
7	9	352.7665	17	9	1850.5301	27	9	4522.9886
8	0	375.9062	18	0	1903.0254	28	0	4604.8517
8	3	399.7666	18	3	1956.2537	28	3	4686.4876
8	6	424.3625	18	6	2010.2171	28	6	4770.7787
8	9	449.2118	18	9	2064.9140	28	9	4854.8434

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USEFUL INFORMATION—CONTINUED

STEAM HEATING

The following is a rough-and-ready rule for calculating the square feet of heating surface required in a building, based upon an outside temperature of —10°:

DIRECT RADIATION

Frame residences,	down stairs	1	square	foot	to	50	cubic feet air.
" "	up stairs	1	"	"		60	" "
Brick "	down stairs	1	"	"		60	" "
" "	up stairs	1	"	"		70	" "
Office Buildings		1	"	"		60	" "
Factories		1	"	"		125	" "
Churches and Assembly Halls		1	"	"		200	" "

Indirect Radiation, 50% more surface.
Direct Indirect Radiation, 25% more surface.

BOILER SURFACE

(A. R. Wolff.)

For heating mills, shops and factories, 1 square foot of boiler-heating surface should be supplied for each 475 cubic feet of contents of building; and the same allowance should also be made for heating exposed wooden dwellings. For heating foundries and wooden shops, 1 square foot of boiler-heating surface should be provided for each 400 cubic feet contents; and for structures in which glass enters very largely, such as conservatories, exhibition buildings and the like, 1 square foot boiler-heating surface should be provided for each 275 cubic feet of contents of building.

(Babcock & Wilcox Co.)

One square foot of boiler surface will supply from 7 to 10 feet of radiating surface, depending upon the size of the boiler and the efficiency of its surface. Small boilers for house use should be larger proportionately than large plants. Each nominal horse-power of boiler will supply from 240 to 360 lineal feet of one-inch pipe, or 80 to 120 square feet of radiating surface.

GRATE SURFACE

(J. R. Willett in "Heating and Ventilation.")

Radiation, square feet	100	200	400	600	800	1000	1600	2000
Grate Surface, square inches	120	208	362	501	630	754	1100	1310

SIZE OF STEAM PIPES

(J. R. Willett in "Heating and Ventilation.")

VERTICAL MAIN PIPES OR RISERS.

Diameter Pipe	1	1¼	1½	2	2½	3	3½	4	5	6
Square Feet Rad. Surface	40	70	110	220	360	560	810	1110	2000	3000

A horizontal branch pipe should be one size larger than a vertical pipe for the same surface.

The area of a horizontal main should be nearly equal to the area of all the risers.

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USEFUL INFORMATION—CONTINUED

TABLE OF PROPERTIES OF SATURATED STEAM

PRESSURE, TEMPERATURE, VOLUME, AND DENSITY

Pressure in Pounds per Square Inch Above Vacuum.	Temperature, Fahr.	Total Heat from Water at 32 Deg. in B. T. U.	Volume of One Pound in Cubic Feet.	Density or Wt. of One Cubic Foot in Pounds.	Pressure in Pounds per Square Inch Above Vacuum.	Temperature, Fahr.	Total Heat from Water at 32 Deg. in B. T. U.	Volume of One Pound in Cubic Feet.	Density or Wt. of One Cubic Foot in Pounds.
1	102.1	1112.5	330.36	.0030	70	302.9	1173.8	6.07	.1648
2	126.3	1119.7	172.08	.0058	75	307.5	1175.2	5.68	.1759
3	141.6	1124.6	117.52	.0085	80	312.0	1176.5	5.35	.1869
4	153.1	1128.1	89.62	.0112	85	316.1	1177.9	5.05	.1980
5	162.3	1130.9	72.66	.0138	90	320.2	1179.1	4.79	.2089
6	170.2	1133.3	61.21	.0163	95	324.1	1180.3	4.55	.2198
7	176.9	1135.3	52.94	.0189	100	327.9	1181.4	4.33	.2307
8	182.9	1137.2	46.69	.0214	105	331.3	1182.4	4.14	.2414
9	188.3	1138.8	41.79	.0239	110	334.6	1183.5	3.97	.2621
10	193.3	1140.3	37.84	.0264	115	338.0	1184.5	3.80	.2628
11	197.8	1141.7	34.63	.0289	120	341.1	1185.4	3.65	.2738
12	202.0	1143.0	31.88	.0314	125	344.2	1186.4	3.51	.2845
13	205.9	1144.2	29.57	.0338	130	347.2	1187.3	3.38	.2955
*14.7	212.0	1146.1	26.36	.0380	135	350.1	1188.2	3.27	.3060
15	213.1	1146.4	25.85	.0387	140	352.9	1189.0	3.16	.3162
16	216.3	1147.4	24.32	.0411	145	355.6	1189.9	3.06	.3273
17	219.6	1148.3	22.96	.0435	150	358.3	1190.7	2.96	.3377
18	222.4	1149.2	21.78	.0459	155	361.0	1191.5	2.87	.3484
19	225.3	1150.1	20.70	.0483	160	363.4	1192.2	2.79	.3590
20	228.0	1150.9	19.72	.0507	165	366.0	1192.9	2.71	.3695
21	230.6	1151.7	18.84	.0531	170	368.2	1193.7	2.63	.3798
22	233.1	1152.5	18.03	.0555	175	370.8	1194.4	2.56	.3899
23	235.5	1153.2	17.26	.0580	180	372.9	1195.1	2.49	.4009
24	237.8	1153.9	16.64	.0601	185	375.3	1195.8	2.43	.4117
25	240.1	1154.6	15.99	.0625	190	377.5	1196.5	2.37	.4222
30	250.4	1157.8	13.46	.0743	195	379.7	1197.2	2.31	.4327
35	259.3	1160.5	11.65	.0858	200	381.7	1197.8	2.26	.4431
40	267.3	1162.9	10.27	.0974	210	386.0	1199.1	2.16	.4634
45	274.4	1165.1	9.18	.1089	220	389.9	1200.3	2.06	.4842
50	281.0	1167.1	8.31	.1202	230	393.8	1201.5	1.98	.5052
55	287.1	1169.0	7.61	.1314	240	397.5	1202.6	1.90	.5248
60	292.7	1170.7	7.01	.1425	250	401.1	1203.7	1.83	.5464
65	298.0	1172.3	6.49	.1538	260	404.5	1204.8	1.76	.5669

A British Thermal Unit (B. T. U.) is a measure of the amount of heat necessary to raise the temperature of one pound of water one degree Fahrenheit and requires the expenditure of 772 foot lbs. of energy per minute to produce it.

*Atmospheric pressure, corresponding to 0 on the ordinary steam gauge.

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USEFUL INFORMATION—CONTINUED

BOILERS

PROPORTIONS, HEATING SURFACE AND HORSE-POWER OF STANDARD HORIZONTAL BOILERS

The calculations of heating surface in the following tables are based upon wo-thirds of the shell and the whole of tubes.

Boilers with 4-inch Tubes.					Boilers with 3½-inch Tubes.					Boilers with 3-inch Tubes.				
Shell.					Shell.					Shell.				
Diameter, Inches.	Length, Feet.	Number of Tubes.	Heating Surface. Sq. ft.	Horse-Power at 12 Feet.	Diameter, Inches.	Length, Feet.	Number of Tubes.	Heating Surface Sq. ft.	Horse-Power at 12½ feet.	Diameter, Inches.	Length, Feet.	Number of Tubes.	Heating Surface. Sq. ft.	Horse-Power at 15 Feet.
42	12	22	365	30.4	42	12	25	363	29.0	42	12	45	512	34.1
	14		425	35.4		14		423	33.9		14		597	39.8
	16		486	40.5		16		484	38.7		16		682	45.5
	18		547	45.6		18		545	43.6		18		737	49.2
46	12	26	423	35.2	44	12	30	422	33.8	44	12	48	545	36.2
	14		494	41.2		14		493	39.4		14		635	42.3
	16		564	47.1		16		563	45.0		16		725	48.4
	18		635	52.9		18		633	50.6		18		816	54.5
50	12	35	545	45.4	48	12	40	541	43.3	48	12	50	571	38.1
	14		636	53.0		14		631	50.5		14		666	44.4
	16		726	60.5		16		721	57.7		16		766	51.0
	18		817	68.1		18		842	64.9		18		857	57.2
54	12	42	641	53.4	54	12	48	640	57.2	54	12	66	735	49.0
	14		748	62.3		14		748	59 8		14		857	57.0
	16		855	71.2		16		855	68.4		16		979	65.3
	18		962	80.2		18		962	77.0		18		1102	73.5
60	14	50	880	73.3	60	14	56	865	69.2	60	14	80	1025	68.4
	16		1006	83.8		16		989	79.1		16		1166	77.7
	18		1131	94.2		18		1130	90.4		18		1312	87.5
	20		1257	104.7		20		1272	101.7		20		1458	97.2
62	14	55	958	79.8	62	14	64	973	77.8	62	14	82	1043	69.9
	16		1095	91.2		16		1112	89.0		16		1193	79.5
	18		1232	102.7		18		1251	100.0		18		1353	90.2
	20		1369	114.1		20		1390	111.2		20		1503	100.2
66	14	64	1100	91.7	66	14	72	1085	86.8	66	14	102	1282	85.4
	16		1257	104.7		16		1240	99.2		16		1465	97.6
	18		1414	117.8		18		1395	111.6		18		1648	109.8
	20		1571	130.9		20		1550	124.0		20		1831	122.0
72	16	80	1545	128.8	72	16	92	1548	123.8	72	16	132	1859	124.0
	18		1738	144.8		18		1742	139.4		18		2091	139.4
	20		1931	161.8		20		1936	154.9		20		2323	155.0

The horse-power of boilers is generally rated at much below what the boilers are capable of when furnishing steam to first-class engines. The number of square feet of heating surface allowed in these tables is ample to evaporate sufficient water for one horse-power according to the Centennial Standard (30 lbs. water evaporated at 70 lbs. steam pressure from feed water at 100° F.); also for first-class automatic cut-off engines. Where boilers are properly set and handled, the figures named, with economical engines, can be exceeded 25 per cent.

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USEFUL INFORMATION—CONTINUED

DIRECTIONS FOR SETTING AND OPERATING STEAM PUMPS

We recommend it as being more durable to place pump on a foundation, in preference to a wooden floor, as the latter is liable to rot in time and bring an undue strain on the pipes, and thus cause leaky joints.

Hard-burned brick laid in cement mortar makes best foundation for larger pumps.

Never use pipes of less diameter than given in the tables. Where long pipes are used it is necessary to increase the size to allow for the increased friction. Especially must this be observed in suction pipes. A foot valve and strainer should be attached to suction pipe. *All* pipes should be as short and straight as possible.

Use few elbows, T's and valves, substituting full round bends for elbows, and Y's for T's, as sharp bends greatly increase the friction. Care must be taken to guard against leaks in suction pipe, as a very small leak will supply the pump with air to its full capacity, so that little or no water will be obtained, according to size of leak.

A suction air chamber (made of a short nipple, a T, a piece of pipe of a diameter not less than the suction pipe, and from two to three feet long, and a cap screwed upright into the suction pipe, close to the pump) is always useful; and where the suction pipe is long, in high lifts, or when the pump is running at high speed, it is a positive necessity. Their utility consists in causing a steady and uniform flow of water through suction pipe, and thus preventing "pounding or water hammering," which, without one, is always incident in long suctions.

Water at high temperature cannot be raised any considerable distance by suction, as the vapor discharged from the water so heated follows the receding piston of the pump and resists the entrance of the water, consequently, to pump hot water, always place the supply above the pump, so that it will be supplied from a head.

Use good cylinder oil only, and oil steam end, just before stopping the pump.

Keep stuffing boxes full of good packing, well oiled, and just tight enough to prevent leakage without excessive friction.

If the pump runs badly, make sure that the water valves and water pipes are all right before examining the steam end.

In cold weather open all cocks and drain plugs to prevent freezing when the pump is not in use.

Always see that the pump has a full and steady supply of water or other fluid.

LET THE STEAM END ALONE, if the pump begins to run badly, until fully satisfied that there is no obstruction in the water cylinder, water valves or water pipes.

DON'T PULL THE PUMP APART to see what is inside, as long as it does its work well.

USE A PUMP WELL and carefully, if it is expected to WORK WELL.

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TABLE SHOWING AMOUNT OF WATER DISCHARGED PER STROKE BY A SINGLE-ACTING PUMP

THE DIAMETER OF CYLINDER AND LENGTH OF STROKE BEING KNOWN

The figures at the extreme left of the table are piston, or plunger, diameters; the line of figures across the top are piston, or plunger, strokes; the figures in the body of the table are the capacity, or displacement, in gallons, corresponding to a single stroke. To find the capacity for one revolution, multiply the capacity for a single stroke by two.

Diameter of Cylinder, Inches	LENGTH OF STROKE IN INCHES.						
	2	3	4	5	6	7	12
1¼	.0106	.0159	.0212	.0266	.0319	.0372	.0637
1⅜	.0128	.0192	.0256	.0321	.0385	.0419	.0770
1½	.0153	.0229	.0306	.0382	.0459	.0535	.0918
1¾	.0208	.0312	.0416	.0521	.0625	.0729	.1249
2	.0272	.0408	.0544	.0680	.0816	.0952	.1632
2¼	.0344	.0516	.0688	.0860	.1033	.1205	.2063
2½	.0425	.0637	.0850	.1062	.1275	.1487	.2550
2¾	.0514	.0771	.1028	.1285	.1543	.1799	.3085
3	.0612	.0918	.1224	.1530	.1836	.2142	.3672
3¼	.0718	.1077	.1436	.1795	.2154	.2513	.4312
3½	.0833	.1249	.1666	.2082	.2499	.2915	.4998
3¾	.0956	.1434	.1912	.2390	.2868	.3346	.5736
4	.1088	.1632	.2176	.2720	.3264	.3808	.6528
4¼	.1228	.1842	.2456	.3070	.3684	.4298	.7368
4½	.1377	.2065	.2754	.3442	.4131	.4819	.8262
4¾	.1534	.2301	.3068	.3835	.4602	.5369	.9204
5	.1700	.2550	.3400	.4250	.5100	.5950	1.0200
5¼	.1874	.2811	.3748	.4685	.5622	.6559	1.1240
5½	.2057	.3085	.4114	.5142	.6171	.7199	1.2342
5¾	.2248	.3372	.4496	.5620	.6744	.7868	1.3480
6	.2448	.3672	.4896	.6120	.7314	.8568	1.4688
6¼	.2656	.3984	.5312	.6640	.7968	.9296	1.5930
6½	.2872	.4308	.5744	.7182	.8610	1.0052	1.7955
6¾	.3098	.4647	.6196	.7745	.9294	1.0840	1.8580
7	.3332	.4998	.6664	.8330	.9996	1.1662	1.9992
7¾	.4084	.6126	.8168	1.0210	1.2250	1.4290	2.4500
8	.4352	.6528	.8704	1.0880	1.3056	1.5232	2.6112
9	.5508	.8263	1.1010	1.3770	1.6524	1.9278	3.3048
10	.6800	1.0200	1.3600	1.7000	2.0400	2.3800	4.0800
11	.8227	1.2341	1.6451	2.0570	2.4640	2.8790	4.9367
12	.9792	1.4680	1.9584	2.4480	2.9376	3.4222	5.8752
13	1.1490	1.7230	2.2970	2.8720	3.4450	4.0220	6.8940
14	1.3320	1.9980	2.6650	3.3310	3.9970	4.6640	7.9940
15	1.5290	2.2940	3.0590	3.8240	4.5890	5.3540	9.1780
16	1.7400	2.6100	3.4800	4.3500	5.2200	6.0900	10.4400
18	2.2020	3.3030	4.4040	5.5050	6.6060	7.7070	13.2100
20	2.7200	4.0800	5.4400	6.8000	8.1600	9.5200	16.3200

To obtain the capacity of a pump with diameter of cylinder given in the table, but with a longer stroke than 12 inches (the longest stroke given in table), add or multiply the capacity to represent the required length of stroke.

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USEFUL INFORMATION—CONTINUED

CAPACITY OF PUMPS AT 100 FEET PISTON SPEED

Ordinarily, a travel of one hundred feet per minute is considered a fair speed for pistons of pumps.

For feeding boilers it should not exceed fifty feet per minute. In fire pumps, where the largest quantity of water is required, the speed may exceed two hundred per minute.

THEORETICAL CAPACITY OF PUMPS AT 100 FEET SPEED OF PISTON OR PLUNGER PER MINUTE

Diameter of Pump or Plunger in Inches.	Gallons Discharged per Minute.	Diameter of Pump or Plunger in Inches.	Gallons Discharged per Minute.	Diameter of Pump or Plunger in Inches.	Gallons Discharged per Minute.	Diameter of Pump or Plunger in Inches.	Gallons Discharged per Minute.
1	4.08	3	36.75	6	147	14	800
1 1/8	5.16	3 1/4	43.13	6 1/2	172	15	917
1 1/4	6.38	3 1/2	50.02	7	200	16	1044
1 3/8	7.71	3 3/4	57.42	7 1/2	229	18	1321
1 1/2	9.18	4	65.34	8	261	20	1631
1 5/8	10.78	4 1/4	73.76	8 1/2	295	22	1974
1 3/4	12.58	4 1/2	82.70	9	330	24	2350
1 7/8	14.35	4 3/4	92.14	9 1/2	368	26	2757
2	16.33	5	102.00	10	408	28	3270
2 1/4	20.67	5 1/4	112.00	10 1/2	450	30	3670
2 1/2	25.52	5 1/2	123.00	11	494	32	4176
2 3/4	30.88	5 3/4	135.00	12	587	34	4715

For practical purposes deduct ten per cent, as no pump will deliver i retical capacity.

PERCENTAGE OF SAVING OF FUEL BY H ATING FEED WATER

Steam at Sixty Pounds.

Final Temperature.	INITIAL TEMPERATURE OF WATER.											
	32°	40°	50°	60°	70°	80°	90°	100°	120°	140°	160°	180°
60°	2.39	1.71	0.86	----	----	----	----	----	----	----	----	----
80°	4.09	3.43	2.59	1.74	0.88	----	----	----	----	----	----	----
100°	5.79	5.14	4.32	3.49	2.64	1.77	0.90	----	----	----	----	----
120°	7.50	6.85	6.04	5.23	4.40	3.55	2.68	1.80	----	----	----	----
140°	9.20	8.57	7.77	6.97	6.15	5.32	4.47	3.61	1.84	----	----	----
160°	10.90	10.28	9.50	8.72	7.91	7.09	6.26	5.42	3.67	1.87	----	----
180°	12.60	12.00	11.23	10.46	9.68	8.87	8.06	7.23	5.52	3.75	1.91	----
200°	14.30	13.71	13.00	12.20	11.43	10.65	9.85	9.03	7.36	5.62	3.82	1.96
220°	16.00	15.42	14.70	14.00	13.19	12.33	11.64	10.84	9.20	7.50	5.73	3.93
240°	17.79	17.13	16.42	15.69	14.96	14.20	13.43	12.65	5.11	9.37	7.64	5.90
260°	19.40	18.85	18.15	17.44	16.71	15.07	15.22	14.45	11.88	11.24	50.60	7.86

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